

From: EACOCK, MICHAEL <meacock@usbr.gov>
Sent: Monday, June 30, 2014 4:43 PM
To: Wong, Margaret@Waterboards; Karkoski, Joe@Waterboards
Cc: Stacy Brown; Carter Sheryl; Gordus, Andy@Wildlife; McGahan, Joseph
Subject: Fwd: Grassland Bypass Project - 2014 draft WDR - comments
Attachments: 2009 GBP UA3 ROD.pdf; 2013 ltr to regional board_update of lng-term drainage mgt plan for gbp wdr.pdf; End Year 2013 Report to meet loads 122613.pdf; GBP_Att A_info_v2_scc-107 (1).docx; 2_gbp_wdr.pdf; 3_gbp_wdr_att_a.pdf

Correction to mitigation for Use of Mud Slough

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----- Forwardedmessage-----

From: EACOCK, MICHAEL <meacock@usbr.gov>
Date: Mon, Jun 30, 2014 at 4:23 PM
Subject: Grassland Bypass Project - 2014 draft WDR - comments
To: Margaret Wong <margaret.wong@waterboards.ca.gov>, "Karkoski, Joe@Waterboards" <Joe.Karkoski@waterboards.ca.gov>
Cc: "McGahan, Joseph" <jmcgahan@summerseng.com>, Gordus Andy <AGORDUS@dfg.ca.gov>, Carter Sheryl <SCARTER@usbr.gov>, Stacy Brown <sbrown@usbr.gov>

Hi Margaret and Joe

Here are my comments on the 2014 Draft Waste Discharge Requirements and Attachment A Information Sheet for the Grassland Bypass Project.

~~~~~  
WDR;

2009 EIS/EIR - the decision document is the 18 December 2009 Record of Decision (attached) that implements the GBP plus the terms and conditions specified in the 09 December 2009 Biological Opinion (198 pages, available on request).

Page 4.

Paragraph 18. What are the boron objectives for Mud Slough?

Paragraph 19. Again, what is the objective for boron in Mud Slough that has been violated? FYI - Our data indicate that there have not been any violations of boron objectives in the SJR at Crows Landing.

Page 5

Paragraph 22. Cite the Drainage Plan and December 2103 update issued by the Grassland Area Farmers. (Attached) Also Page 14, paragraph B.3

Page 6

footnote 6. ROD-07-141, dated 18 December 2009

Page 7

paragraph c). cite 26 December 2013 Plan to meet selenium loads

paragraph d). Check 19 is located at Russell Avenue. The mileposts for the San Luis Drain are very confusing.

paragraph e). the fish barrier is not related to the GBP

paragraph g). confirm the Mud Slough barriers with Joe McGahan

paragraph h). We measure the accumulation of sediments in the San Luis Drain, as well as the concentrations of selenium in annual surveys. The 2009 Use Agreement deals with the removal and disposal of sediment from the Drain. FYI - the concentration of selenium in SLD sediments is highly variable but not close to the 100 ppm wet weight specified in the California Code of Regulations. Title 22. Division 4.5. Chapter 11. Article 3. §66261.24 (a)(2)(A) Table II – List of Inorganic Persistent and Bioaccumulative Toxic Substances and their Soluble and Total Threshold Limit Concentration Values

paragraph i). In 2013, approximately 25,000 acre-feet of GDA drain water were displaced from the GBP to irrigate salt tolerant crops in the SJRIP.

paragraph j). The San Luis Demonstration Treatment Plant will be operating in summer 2014.

paragraph k). Mitigation for the use of Mud Slough, as described in Appendix L of the 2009 Use Agreement, has been implemented. In 2014, the refuges accepted money from the Grassland Farmers to purchase supplemental water and power to operate wells.

Page 9

paragraph 37. This is not applicable to this WDR.

Page 10

paragraph 45. All facilities associated with the GBP are on federal, state, or district property. There should be no problems providing access to Regional Board staff to any GBP facilities. Same comment for Page 14, paragraph B.6

Page 15

paragraph V.E. The dischargers participate in CV-SALTS and a real-time salt management program.

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Attachment A - Info sheet - see track changes in document

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Please call me or Stacy Brown if you have any questions or require more supporting data.

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# RECLAMATION

*Managing Water in the West*

## Record of Decision

# Grassland Bypass Project, 2010-2019

ROD-07-141

Recommended by:



Date: 12/18/2009

Michael Delamore  
Acting Deputy Area Manager  
South-Central California Area Office

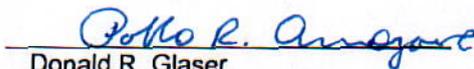
Concurred by:



Date: 12/18/2009

Michael A. Chotkowski  
Regional Environmental Officer  
Mid-Pacific Regional Office

Approved by:



Date: 12/21/09

Donald R. Glaser  
Regional Director  
Mid-Pacific Regional Office



## Introduction

This document constitutes the Record of Decision (ROD) of the Department of the Interior, Bureau of Reclamation (Reclamation), Mid-Pacific Region, regarding the execution of a new Use Agreement for the continued use of the San Luis Drain, 2010–2019, (2010 Use Agreement) that will enable the San Luis & Delta-Mendota Water Authority (Authority) to continue the Grassland Bypass Project (GBP) through December 31, 2019. The Preferred Alternative is the subject of the *Final Environmental Impact Statement/Environmental Impact Report, Grassland Bypass Project, 2010-2019* (FEIS/EIR), dated September 29, 2009 and developed in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

## Background

The original Use Agreement, dated November 3, 1995, allowed the Authority to use a portion of the San Luis Drain (Drain) to convey agricultural drainwater through adjacent wildlife management areas to Mud Slough, a tributary to the San Joaquin River. The 1995 Use Agreement allowed for use of the Drain until September 30, 2001. The 2001 Use Agreement allowed continuation of the use of the Drain through December 31, 2009. The 2010 Use Agreement will permit the Authority to continue the GBP through December 31, 2019.

The purpose and objectives of the continuation of the GBP, 2010–2019 (Preferred Alternative) are:

- To execute the 2010 Use Agreement in order to allow the Grassland Area Farmers (GAF) time to acquire funds and develop feasible drainwater treatment technology to meet water quality objectives<sup>1</sup> by December 31, 2019.
- To continue the separation of unusable agricultural drainage water discharged from the Grassland Drainage Area (GDA) from wetland water supply conveyance channels for the period 2010–2019.
- To facilitate drainage management that maintains the viability of agriculture in the Project Area.
- To promote continuous improvement in water quality in the San Joaquin River to achieve zero discharge of subsurface drainage from irrigated lands in the GDA.

The Preferred Alternative is needed to assure that any future use of the Drain beyond 2009 is consistent with the long-term Westside Regional Drainage Plan and the San Luis Drainage Feature Re-evaluation (SLDFR) Plan for drainage service. Execution of the 2010 Use Agreement

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<sup>1</sup> As specified in The Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin (Basin Plan), as amended, and the revised Waste Discharge Requirements (WDR) for the Grassland Bypass Project.

provides for compliance with applicable water quality control programs including Basin Plan and WDR amendments.

## **Decision**

Reclamation's decision is to execute the 2010 Use Agreement in order to implement the Preferred Alternative identified in Section 2.2 of the FEIS/EIR. The decision includes implementation of the mitigation measures listed in Section 15 of the FEIS/EIR and the reasonable and prudent measures and terms and conditions in the 2009 Biological Opinion from the U.S. Fish and Wildlife Service (FWS). These measures are required to implement the Preferred Alternative.

Execution of the 2010 Use Agreement will result in continuing the present drainwater conveyance using the Drain with discharge of a portion of the collected drainwater to Mud Slough, an updated compliance monitoring plan, revised selenium and salinity load limits, an enhanced incentive performance fee system, a new WDR from the Regional Water Quality Control Board, and mitigation for continued discharge to Mud Slough. In-Valley treatment/drainage reuse at the San Joaquin River Water Quality Improvement Project (SJRIIP) facility will be expanded to 6,900 acres.

## **Alternatives Considered**

### **No Action**

The No Action Alternative is defined as what could be expected to occur in the foreseeable future (after December 31, 2009) if the 2010 Use Agreement for the Drain is not approved. The No Action Alternative is a construct based upon not executing the 2010 Use agreement, as well as continuing an ongoing program for drainage management, including the initial phases of the treatment/drainage reuse facility known as the SJRIIP. Under this alternative, the GAF would not have use of the Drain. Agricultural subsurface drainage would not be collected into a single drainage outlet (Grassland Bypass Channel) for conveyance to the Drain. However, the GAF would still be responsible for meeting WDR and the Basin Plan requirements which would require projects that are not currently planned or financed, at both the district and farmer level, in order to maintain viable agriculture over the long term.

### **Preferred Alternative**

The continuation of the GBP for the period 2010 to 2019 is the Preferred Alternative due to its water quality and wetland enhancement over the long term. The 2010 Use Agreement will consolidate subsurface drainflows on a regional basis and utilize a portion of the Drain to convey drainflows around wetland habitat areas. Key components are summarized below.

Existing features of the GBP that will continue under the Preferred Alternative include the following:

- The removal of agricultural drainwater from 93 miles of conveyance channels in the Grassland wetlands and wildlife refuges, except during high rainfall conditions. Any discharges to these conveyance channels will be in accordance with the existing Storm Water Plan as modified consistent with the 2010 Use Agreement.
- The use of the Grassland Bypass Channel, a four-mile-long constructed earthen ditch and an existing drain that was modified to convey drainwater from the Panoche and Main drains to the Drain near South Dos Palos, California.
- The use of 28 miles in the Drain to its northern terminus near Gustine, California. From that point, the drainwater will enter Mud Slough (North) for six miles before reaching the San Joaquin River at a location three miles upstream of its confluence with the Merced River.

New features of the GBP that will be implemented under the Preferred Alternative include:

- Execution of the 2010 Use Agreement for the Drain (Appendix A), to include an updated compliance monitoring plan, revised selenium and salinity load limits, an enhanced incentive performance fee, a new WDR from the Regional Board, and mitigation for continued discharge to Mud Slough.
- In-Valley treatment/drainage reuse at the SJRIP facility.
- Sediment management plan to remove and dispose of sediment from the Drain, to improve flow capacity.
- Utilizing and installing drainage recycling systems to mix subsurface drainwater with irrigation supplies under strict limits.
- Continuing current land retirement policies listed in the 1998 *Long-Term Drainage Management Plan for the GDA* and subsequent Westside Plan. Key among these is that land retirement should be voluntary.
- Implementing a compliance monitoring program with biological, water quality, and sediment components. Results of the monitoring program will be reviewed by an interagency oversight committee.
- Continuing the operation of a regional drainage management entity to perform management, monitoring, and funding of necessary control functions.
- A single WDR for the GDA.
- An active land management program to utilize subsurface drainage on salt-tolerant crops.

- Low-interest loans for irrigation system improvements, such as gated pipe, sprinkler, and drip irrigation systems.
- An economic incentive program including tiered water pricing and tradable loads.
- A no-tailwater policy that will prevent silt from being discharged into the Drain and promote the secondary benefits of irrigation water management.
- Implementing drainwater displacement projects such as using subsurface drainage for dust control on roadways.
- Meeting with landowners as necessary to implement projects and policies cited above.

### **Environmentally Preferable Alternative**

The Preferred Alternative is the environmentally preferable alternative because it will result in greater environmental benefits (improved water quality and lesser biological impacts) to the San Joaquin River and includes mitigation for water quality impacts on Mud Slough. The slough is potential habitat for the giant garter snake and other sensitive species.

### **Alternative Action**

The only other reasonable alternative is known as the 2001 Requirements Alternative and is similar to the Preferred Alternative in all aspects except the selenium and salt loads discharged to Mud Slough would be limited to those in the 2001 Use Agreement (i.e., less stringent allowances and compliance date). Existing project features that would continue under this alternative include all of those for the Preferred Alternative, except the load values and incentive fees would be those associated with the 2001 Use Agreement. It does not include the Mud Slough mitigation component. This alternative does not avoid or substantially lessen any potentially significant impact of the Preferred Alternative but it is technically feasible. While the Alternative Action does not meet current Mud Slough selenium objectives for 2010, it does meet San Joaquin River objectives. In short, it represents a continuation of the 2001 Use Agreement “as is” until December 31, 2019.

### **Basis of Decision, Issues Evaluated, and Factors Considered**

The No Action Alternative is not a feasible alternative because it fails to meet the first three of the four purposes of the Project. It does not keep drainwater out of the wetland channels. Also, the viability of agriculture would be adversely affected. The Alternative Action is not the preferred alternative because it does not provide the same level of protection for water quality and biological resources; selenium and salt load discharge allowances would be less stringent, and no Mud Slough mitigation would be provided. The Preferred Alternative will have the following negative impacts on the resources listed below. Impacts on other resources will either

be beneficial, minimal, or non-existent. Land use and environmental justice concerns will be beneficial compared to the No Action because the Preferred Alternative will continue viable agriculture in the affected area.

## **Air Quality**

Compared to the No Action, average annual power consumption within the GDA will be increased by 21 million kWh. Use of electric power contributes to climate change indirectly through the combustion of fossil fuels in power plants, along with generating resources, which do not emit greenhouse gases (GHGs). Operation of the treatment facility using electric power will result in increased indirect GHG emissions that are neither substantial nor significant (compared to the No Action), but which will cumulatively contribute to climate change.

Greenhouse gases will be emitted during construction of the new treatment facility, primarily from diesel-powered construction equipment, although this amount will be small when compared to indirect GHG emissions caused by long-term facility operation. Since it is likely that the SJRIP facility will be operated at its peak capacity during the summer months when power demand is at its greatest, energy conservation, and thus GHG emissions minimization, will be considered in both the design and eventual operation of the treatment facility, to the maximum extent feasible. Since the Preferred Alternative effects are not substantial, mitigation measures are not required. Additional indirect GHG emissions will incrementally add to the cumulative contributions and effects of all other sources of GHG emissions, both in the state and world-wide.

## **Biological Resources**

Compared to the No Action Alternative, the Preferred Alternative will continue to expose listed and sensitive species in Mud Slough and the San Joaquin River below the Mud Slough tributary (Area 3) to selenium from the GDA. During wetter years, the Sacramento splittail will be exposed. During wetter years, wetland habitat will experience higher selenium exposure in Area 3. However, mitigation for water quality impacts in Mud Slough will be provided, and water quality will improve by 2015.

Migratory birds will be exposed to elevated selenium on the expanded reuse area for the SJRIP. Monitoring will continue across the reuse area to count nesting birds and measure selenium exposure. Hazing will continue, and mitigation habitat will be provided. Current data show that few birds have been nesting in the SJRIP and that the mitigation area is attracting birds away from the reuse area. The protective measures implemented for the current reuse area will also apply to the expanded acreage.

On December 18, 2009, the FWS issued a biological opinion (2009 Biological Opinion) to Reclamation concluding that the Preferred Alternative may affect the giant garter snake (*Thamnophis gigas*) and the San Joaquin kit fox (*Vulpes macrotis mutica*). The 2009 Biological Opinion provides reasonable and prudent measures and terms and conditions to implement those measures. The operation of the entire project, including the SJRIP reuse area, will be subject to the terms and conditions specified in the 2009 Biological Opinion. On November 18, 2009, the

National Marine Fisheries Service (NMFS) provided a letter concurring with our determination that execution of the 2010 Use Agreement may affect, but is not likely to adversely affect, Federally threatened Central Valley steelhead (*Oncorhynchus mykiss*), threatened Central Valley spring-run Chinook salmon (*O. tshawytscha*), endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha*), threatened Southern Distinct Population Segment (DPS) of North American green sturgeon (*Acipenser medirostris*), or any of the critical habitat designated for these listed species. NMFS found that no conservation recommendations were needed for essential fish habitat.

## Surface Water Resources

### Selenium, Salinity, Boron and Molybdenum

Relative to the No Action, the Preferred Alternative will continue the discharge of agricultural drain water in Mud Slough and the San Joaquin River, subject to monthly and annual loads specified in the Use Agreement and WDR to achieve the water quality objectives in the amended Basin Plan. Reclamation, in cooperation with other agencies, will implement the GBP Compliance Monitoring Program that will measure the concentrations of selenium and salts in water, sediment, and biota across the region. The loads of salts and selenium in Mud Slough will decrease by 2015.

Compared to the No Action Alternative, selenium water quality objectives will not be met in Mud Slough and the San Joaquin River upstream of the confluence with the Merced River. Salinity and boron concentrations in Mud Slough and the San Joaquin River downstream of Mud Slough will increase compared to the No Action Alternative. Molybdenum concentrations in Mud Slough and the San Joaquin River downstream of Mud Slough will be higher and water quality objectives will be exceeded more frequently.

### Sediment Accumulation in the San Luis Drain

The Compliance Monitoring Program (Reclamation et al. 1996) for the GBP specifies annual monitoring of the accumulation of sediment in the Drain. The estimated volume of sediment in the Drain increased by 140,000 cubic yards since 1998.

The water velocity within the Drain is kept below one foot per second to prevent the suspension of material from the sediment bed. The slower velocity also increases the rate at which suspended solids drop out of the water column. Therefore, the accumulation of sediment will continue to occur, although the rate can be reduced if large storm events are bypassed around the Drain. The rate of accumulation is estimated to be about one to two inches per year spread through the entire Drain. Currently, the Drain has greater than one foot of freeboard during peak flows of 150 cubic feet per second. If additional sediment accumulates to the extent that it will pose a problem to the use of the Drain or to downstream resources, the sediment will be removed in accordance with the 2010 Use Agreement, applicable laws and regulations, and the Sediment Management Plan provided in Appendix B of the FEIS/EIR. This will mitigate the impact of the sediment accumulation. Fill of wetlands and other waters of the U.S. from sediment removal and disposal will be avoided by following the Sediment Management Plan.

## Implementing the Decision and Environmental Commitments

Reclamation and the Authority have adopted all practicable means to avoid or to minimize adverse environmental impacts of the Preferred Alternative. Chapter 15 of the FEIS/EIR is the Mitigation Monitoring and Reporting Program (MMRP) for the Preferred Alternative.

Compliance with the terms and conditions in the 2010 Use Agreement requires a monitoring plan and reporting of the results. Section V, paragraph A of the 2010 Use Agreement states that the Authority shall be responsible for implementing a comprehensive monitoring program that meets the following objectives:

- to provide water quality data for purposes of determining the Authority's compliance with Selenium Load Values and Salinity Load Values as set forth in this Agreement;
- to provide biological data to allow an assessment of whether or not any environmental impacts constitute Unacceptable Adverse Environmental Effects that have resulted from this Agreement; and
- to provide data on sediment levels, distribution, and selenium content.

In addition to the MMRP, Reclamation and the Authority will comply with all the terms and conditions found in incidental take statement appended to the 2009 Biological Opinion.

The 2010 Use Agreement includes the Compliance Monitoring Program; results pertaining to the discharges of selenium and salts being delivered from the Drain to Mud Slough, will be submitted to Reclamation, the Oversight Committee, and other interested parties. (Section V, Paragraph B).

Results of the monitoring program will be reviewed frequently as required to implement this Agreement, by technical representatives on the Oversight Committee. If unacceptable problems or impacts are identified, appropriate mitigative actions to address the problems will be identified by the Oversight Committee. The definition and identification of "unacceptable" problems or impacts and need for mitigative action will consider applicable environmental laws as well as the impacts in all channels affected by implementation of the Preferred Alternative. Appropriate mitigative actions, depending on the situation, will include, but not necessarily be limited to, interruption of a specific identified contamination pathway through hazing or habitat manipulation, increased management, enhancement, and recovery activities directed at impacted species in channels cleaned up as a result of the GBP, and/or establishment and attainment of more stringent contaminant load reductions. The costs of mitigation, as well as any required cleanup, will be borne by the Authority.

## Compliance Monitoring Plan

Under the Preferred Alternative, Reclamation, in cooperation with other agencies, will continue to implement the GBP Compliance Monitoring Plan. The key features of the GBP Compliance Monitoring Plan include:

- Daily compliance monitoring for flow and water quality (daily data at Station B and Station N).
- Continuous measurement of flow, salinity, and temperature at five sites;
- Collection of weekly samples at stations in local sloughs and the San Joaquin River;
- Quarterly monitoring for selenium in biota and sediment upstream and downstream of the Project;
- Annual measurements of sediment volume and selenium concentration in the Drain;
- Quality assurance, verification, and management of data by Reclamation;
- Review and analysis of all data by state, Federal, and local agencies;
- Publication of monthly and quarterly data reports and annual analytical reports;

The GBP Compliance Monitoring Plan may be revised by the Data Collection and Review Team based on the 1996–2009 results and the requirements of the 2010 WDR. The WDR will include the Storm Management Plan.

## Sediment Management Plan

The Sediment Management Plan (Appendix B of the FEIS/FEIR) includes the following monitoring protocol to be applied to all land application sites until selenium levels have decreased to unrestricted use (in areas where applied sediments exceeded ecological or human health risk criteria). In areas where revegetation was conducted as part of the application of sediments, monitoring will continue until the predetermined success criteria for the revegetation program is met (i.e. percent cover or establishment of a particular vegetation community).

- Quarterly monitoring of soil, water, and groundwater to confirm that soluble selenium is not migrating toward the water table;
- Biannual soil sampling to monitor selenium displacement and solubility;
- Annual plant sampling and analysis at agriculture and open space sites to confirm that selenium is not being accumulated to levels of concern. Selenium uptake may change as selenium solubility increases;

- Installation of either neutron probe access pipes and/or tensiometers in agricultural sites to measure soil water movement.

## **Storm Event Plan**

A Storm Event Management Plan has been developed describing how the GBP will operate during storm events. The major concerns with allowing high flows into the Drain are related to excess sediment loading and accumulation in the Drain and scour of previously accumulated sediment from the Drain into the receiving waters due to high water velocities. In addition, structural integrity of the bypass channel is of concern.

The major components of the Storm Event Management Plan include the following:

- Notification of regulatory and system users to inform them of the intent to operate under the storm event plan when Project flows are to be affected by impending storm events;
- Opening of gates to Grassland Water District (GWD) supply channels (Agatha Canal and Camp 13 Ditch) when anticipated flows exceed 100 cubic feet per second and precipitation is imminent;
- In-field decisions on how much to divert to GWD and how much to allow into the Project during event conditions;
- Closing gates to GWD supply channels when flow falls below 100 cubic feet per second and no further threat of imminent precipitation exists;
- Daily monitoring of bypassed flows to the GWD for quantity and quality;
- Modification of sump pump operations as practical to minimize the production of drainwater.

## **Other Mitigation and Environmental Commitments**

Section III, paragraph H of the 2010 Use Agreement contains environmental commitments pertaining to operations, spill prevention, downstream users notification, regional archaeology, protection of China Island, Mud Slough, sediment, and load reduction assurances. In addition, Reclamation and the Authority will implement those reasonable and prudent measures and terms and conditions in the 2009 Biological Opinion.

As part of the GBP, the Authority plans to complete the development of the SJRIP reuse facility on up to 6,900 acres of agricultural land. The Negative Declaration on Phase I (and subsequent Negative Declaration in August 2007 on expansion of the facility) commits the GAF/Panoche Drainage District to a biological monitoring program that will be capable of detecting migratory bird impacts and, if necessary, capable of providing the data for project adjustments to avoid such impacts.

## Comments on the Final Environmental Impact Statement/Final Environmental Impact Report

The Notice of Availability of the FEIS/EIR was published in the Federal Register on September 29, 2009. Between that date and the execution of this ROD, six comment letters were received: three from the California Water Impact Network/California Sportfishing Protection Alliance (CWIN/CSPA) (October 7, 2009, October 29, 2009, and December 9, 2009), two from the FWS (October 27, 2009 and November 18, 2009 via electronic mail), and one from the United States Environmental Protection Agency (EPA) on October 23, 2009. A letter from the City of Stockton (City) was received on September 3, 2009, prior to the publication of the Notice of Availability, but after the release on August 6, 2009 of the FEIS/EIR under CEQA. Additionally, it was discovered that a comment letter from Revive the San Joaquin that had been submitted on the Draft EIS/EIR (DEIS/EIR) on February 10, 2009, had been misplaced shortly after its submission. Reclamation provided a detailed response to Revive the San Joaquin (RSJ) by letter on November 30, 2009. The issues raised in these letters are summarized and discussed below:

### Thresholds of Significance

Comments were received concerning analysis of water quality impacts and thresholds of significance used in the FEIS/EIR. The City of Stockton and C-WIN/C-SPA (by reference) commented that the response to their original comment fails to address the substance of their concerns about narrative water quality objectives in the Basin Plan and that these narrative objectives should be used to develop specific numeric standards of significance, in particular, salinity. The City objects to the use of "frequency of WQO exceedances" and says this does not ensure that the Project will not "substantially degrade water quality."

*Response:* The comments regarding thresholds of significance relate primarily to CEQA, rather than NEPA, standards for analysis. The Authority, prior to their certification of the Final EIR, responded to the City's comments and C-WIN/C-SPA's October 7, 2009 comment letter on the FEIS/EIR. Those responses are incorporated herein by reference. The FEIS/EIR explains the relevance of the criteria used. The evaluation of impacts used existing water quality objectives, ecological risk guidelines, and other available information to evaluate and describe potential impacts of the project. It is beyond the scope of the project or the role of Reclamation to establish new or additional numeric objectives or criteria as appears to be proposed in the City's comments.

### Range of Alternatives

Several comments addressed the scope of the project and the range of alternatives considered in the FEIS/EIR. The City, C-WIN/C-SPA, and RSJ commented that the FEIS/EIR failed to consider a meaningful range of alternatives, in particular permanent land retirement. RSJ suggested supporting commercial hydroponics as an alternative action. The City also commented that the No Action Alternative makes unreasonable and unsupported assumptions about agricultural and water management practices in the GBP Area. C-WIN/C-SPA stated that "In particular, the No Action Alternative is not accurate because, absent the Preferred Alternative,

regulatory enforcement will be used to alleviate the water quality problems associated with drainage.”

RSJ further commented that the scope of the project and alternatives is too narrow, piecemealed and postpones or fails to resolve the overall drainage problem. C-WIN/C-SPA requested that the 2010 Use Agreement be renewed for only two years, during which time the United States Geological Survey Decision Analysis be used to identify a drainage strategy for the San Luis Unit, and that a new NEPA/CEQA process be initiated integrating Reclamation’s SLDFR and the GBP into one document.

*Response:* The FEIS/EIR provides information on 20 alternatives considered and the criteria, based on the Purpose and Need, used for determining which alternatives were evaluated in the FEIS/EIR versus those eliminated from further consideration. The Alternatives Report (updated in 2008 and incorporated by reference in the DEIS/EIR, page 2-24), contains discussion of Land Retirement and other alternatives mentioned in City’s and C-WIN/C-SPA’s comments. The No Action Alternative is based on existing and reasonably foreseeable conditions in the absence of the Preferred Alternative. The assumptions with respect to the No Action Alternative are identified in the FEIS/EIR. The City’s comments offer no new information or explanation as to why they consider the assumptions to be unreasonable and unsupported. With respect to regulatory enforcement, the California Regional Water Quality Control Board has recognized that in cases of non-point source discharges from agriculture, the issuance of individual waste discharge requirements is not an assured mechanism for attainment of water quality objectives. There is simply no basis in the record or otherwise to assume that if there were no project, regulation would resolve water quality issues associated with drainage.

With respect to the scope of the project and alternatives, the Purpose and Need is identified in the FEIS/EIR. The federal action under consideration by this project is not to address the long term drainage needs and issues of the San Luis Unit, but rather to allow continued use of the San Luis Drain for up to 10 years under specified terms and conditions as identified in the FEIS/EIR. The long term drainage needs of the San Luis Unit as a whole were addressed in the SLDFR EIS and Feasibility Report and are the subject of ongoing activities including proceedings in the District Court.

### **New Information**

C-WIN/C-SPA and FWS suggested that new information had become available since the FEIS/EIR relevant to the GBP. C-WIN/C-SPA and FWS cited a recent report prepared by HT Harvey as new information that suggests more significant impacts to wildlife from exposure to selenium in the reuse area than identified in the FEIS/EIR. C-WIN/C-SPA also cited a recent decision by the federal courts on the Stockton East case as new information “extremely relevant to the Grassland Bypass Project”. In supplemental comments, C-WIN/C-SPA further elaborated that the FEIS/EIR fails to identify how Reclamation intends to meet salinity objectives in the San Joaquin River without New Melones dilution flows as a consequence of the legal decision.

*Response:* The HT Harvey report referenced in the comments is the latest in a series of annual reports of monitoring at the reuse area. The SJRIP reuse area has an ongoing

tiered contaminant monitoring program that covers monitoring for avian and terrestrial species. The egg monitoring program has been ongoing since 2001. Selenium in eggs has been monitored and reported annually to the FWS. Selenium in egg levels have been elevated for some time, which has been taken into account in the evaluation of impacts in the FEIS/EIR. The monitoring program identifies subsequent steps depending on the test results and is not new information. The monitoring has also in previous years identified Swainson's hawks, burrowing owls and tri-colored blackbirds in the project area and this information was taken into account in the mitigation measures proposed for the project.

The comment regarding a recent federal court decision apparently refers to the case decided September 30, 2009, by the United States Court of Appeals for the Federal Circuit, 2007-5142, Stockton East Water District, et al, v. United States. The case decides claims for damages for breach of contractual rights of two Central Valley Project contractors from the New Melones Unit of the Central Valley Project who are not involved in the Grassland Bypass Project, and remands the case to the trial court for a determination of monetary damages. Whether or not the case will ever bear on the operations of the Central Valley Project to meet water quality obligations under its water rights permits is speculative. In any event, the purpose of the Preferred Alternative is not to identify how Reclamation intends to meet water quality obligations under its water rights permits. The court decision does not represent new information relevant to the Purpose and Need for the Preferred Alternative as identified in the FEIS/EIR, nor the effects or mitigation measures proposed.

## **Biological Opinion**

C-WIN/C-SPA requested that a revised FEIS/EIR be prepared and circulated as a new draft because at the time the FEIS/EIR was issued, there were no Biological Opinions by the FWS and National Marine Fisheries Service (NMFS) nor the California Department of Fish and Game (CDFG) available in order for the public to evaluate mitigation measures.

*Response:* A Biological Opinion was issued by the FWS on December 18, 2009. Reclamation and the Authority will implement the reasonable and prudent measures and terms and conditions contained in the 2009 Biological Opinion which are non-discretionary and must be implemented in order for the exemption in section 7(o) (2) of the Endangered Species Act to apply. Implementation of the terms and conditions does not result in a change in the Preferred Alternative or new environmental consequences which had not been considered in the FEIS/EIR.

Reclamation received a concurrence from NMFS with our determination that the Preferred Alternative is not likely to adversely affect federally listed anadromous fishes and their critical habitats, and no measures were required by NMFS. The Authority and the CDFG have identified and agreed upon mitigation terms, some of which are incorporated into environmental commitments and some of which are set out in a Memorandum of Understanding. Those mitigation measures are disclosed in the FEIS/EIR.

## Impacts to Salmonids

RSJ, C-WIN/C-SPA, and the FWS submitted comments regarding the analysis of impacts to salmonids. RSJ commented that the FEIS/EIR should have recognized that the barrier in the San Joaquin River at the Merced River confluence will be removed as part of the San Joaquin River Restoration Program (SJRRP). The FWS commented that the analysis and response to comments on the DEIS/EIR underestimated the likelihood that selenium levels in the lower San Joaquin River are impacting salmonids both currently and in the future, and recommended follow-up monitoring to show whether salmonids are being exposed to selenium for sufficient periods of time in the lower San Joaquin River between Mud Slough and Hills Ferry. C-WIN/C-SPA reiterated the FWS comments and provided e-mail correspondence from Dr. Dennis Lemly supporting their concern.

*Response:* The fish barrier across the San Joaquin River at the confluence with the Merced River is operated independently by CDFG. It is specifically identified in the WDRs for the GBP and will continue to be in operation until barriers called for in the San Joaquin River settlement are installed, and it is therefore not relevant to include in the FEIS/EIR. Paragraph 11(a)(10) of the Settlement Agreement for the SJRRP specifically calls for installation of barriers at Mud Slough and Salt Slough and this is addressed in the June 2009 Fisheries Management plan for the SJRRP. This will provide the same protection to salmon that the currently operated barrier does, i.e. it keeps salmon from migrating into Mud Slough.

The Beckon and Maurer (2008) document referenced in FWS and C-WIN/C-SPA comments was one of several information sources Reclamation reviewed and utilized in the development of the Biological Assessment, the FEIS/EIR, and the responses to comments. Reclamation acknowledged that uncertainty continues to exist, described the uncertainties, and, based on the data and information available, made the determination that the impacts will not be significant to the species. Reclamation consulted with NMFS and on November 18, 2009, received their concurrence with our determination that execution of the 2010 Use Agreement may affect, but is not likely to adversely affect, Federally threatened Central Valley steelhead (*Oncorhynchus mykiss*), threatened Central Valley spring-run Chinook salmon (*O. tshawytscha*), endangered Sacramento River winter-run Chinook salmon (*O. tshawytscha*), threatened Southern Distinct Population Segment (DPS) of North American green sturgeon (*Acipenser medirostris*), or any of the critical habitat designated for these listed species. Reclamation determined that essential fish habitat of Pacific salmon will be adversely affected, and requested consultation pursuant to the Magnuson-Stevens Fishery Conservation and Management Act. In their November 18, 2009, letter, NMFS found that no conservation recommendations were needed for essential fish habitat.

Reclamation's conclusion that the Preferred Alternative will not significantly affect salmonid species due to selenium toxicity arising from the Preferred Alternative is supported by the available data and by regulation, and is a reasonable conclusion. The FWS recommendation concerning monitoring will be considered and incorporated as appropriate, in coordination with the SJRRP, as part of the Compliance Monitoring Plan for the GBP.

**Viability of Drainwater Treatment**

The EPA reiterated a comment that they made on the DEIS/EIR, that they remain concerned about the uncertainty of developing feasible methods of drainwater treatment and disposal that will make it possible to meet selenium objectives by 2019 and arrest the buildup of selenium in groundwater. C-WIN/C-SPA comments also reflected concern over the technical and economic viability of treatment technologies.

*Response:* No further response necessary.



December 26, 2013

Pamela Creedon  
Central Valley Regional Water Quality Control Board  
11020 Sun Center Drive #200  
Rancho Cordova, CA 95670-6114

Subject: Waste Discharge Requirement Order No. 5-01-234, Update of Long Term Drainage Management Plan.

Dear Pamela,

The above Waste Discharge Requirements (WDR) require submission of an update of the long-term drainage management plan for the Grassland Bypass Project. The WDR's were issued to the San Luis & Delta-Mendota Water Authority (Water Authority) and the U. S. Bureau of Reclamation. The Water Authority members that participate in the Grassland Bypass Project are hereafter referred to as the Grassland Area Farmers.

The long-term drainage management plan was submitted on September 30, 1998 in compliance with WDR No. 98-171. The plan has been updated annually since 1999.

**Milestones since Last Update**

The milestones that have occurred for the Grassland Bypass Channel Project since the 2010 update are as follows:

- ◆ The Grassland Area Farmers have reduced the discharge of selenium from the Grassland Drainage Area by 95% since the beginning of the project as measured at the end of Water Year 2013. This is lower than the discharge in Water Year 2012, partly because WY 2013 was a critical year type compared to a dry year type in WY 2012, but also due to increased reuse activities. There were no exceedances of monthly selenium load allocations during Water Year 2013.
- ◆ The Grassland Area Farmers have continued to develop funding for the Westside Regional Drainage Plan as described in previous reports. Panoche Drainage District received \$4.25 million in September 2010 through the U.S. Bureau of Reclamation's San Joaquin River Salinity Management Program with \$3.9 million awarded in 2013. These funds continue to be used to implement a number of activities outlined in the Westside Regional Drainage Plan including projects for groundwater management, development of the reuse area, source control projects and environmental mitigation.
- ◆ The Grassland Area Farmers continue to utilize and expand the San Joaquin River Water Quality Improvement Project (SJRIP). The total acreage of the SJRIP has been increased to more than 6,000 acres, with approximately 5,200 developed to

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salt tolerant crops for drainage reuse. Approximately 26,000 acre feet of drain water were reused on the SJRIP in Water Year 2013.

- ◆ The Grassland Area Farmers are continuing to work closely with the U.S. Bureau of Reclamation to develop an in-valley drainage solution for the Grassland Drainage Area. The In-Valley Solution Plan includes irrigation improvements, seepage reduction, land retirement, recirculation, drainage reuse, and drainage treatment. Reclamation is in the process of developing a demonstration level treatment plant on land in the SJRIP to test treatment methods utilizing subsurface agricultural drainage. Construction on this plant began in December 2012.
- ◆ The discharge from the Grassland Bypass Project in Calendar Year 2012 (dry year type) was 683 pounds of selenium with a load limit of 2,496 pounds. The selenium load discharge during Calendar Year 2013 (critical year type) is projected to be 560 pounds of selenium, approximately 48% below the annual load limit of 1,075 pounds. The actual pounds discharged are not available pending receipt of monitoring reports and will be included in the next update report.

### **Statement of Goals**

The principal goal of the Grassland Area Farmers remains is described in the September 30, 1998 long term drainage management plan. This goal is summarized as providing for the achievement of the water quality objectives fixed by the Regional Board and their Basin Plan related to subsurface drainage discharges from the drainage area while maintaining viable agricultural production in the area.

### **Inflows Not Within the Control of Grassland Area Farmers**

The issue of high drainage flows caused by major storm events continues to be a concern. The 2010-2019 Use Agreement provides for mechanisms to deal with rain induced drainage through the high-rainfall and upper watershed exemptions. It also describes a planning process that may evaluate the utilization of a portion of the San Luis Drain to bypass storm water flows around some wetland areas after 2019, in order to minimize the impact of such flows. Under the Use Agreement, development of a formal plan must begin no later than 2016. Another source of inflows to agricultural drainage systems of the Grassland Drainage Area that continues to be of interest is the contribution from seepage out of the San Luis Canal/California Aqueduct. This issue was described in the 2004 annual report and estimated impacts are being updated.

### **Future Regulation and Milestones**

The Regional Board has adopted a TMDL for salt and boron and one for dissolved oxygen. These TMDLs have subsequently been approved by the State Board and the State Office of Administrative Law. These regulations encompass discharges from a much larger area than the Grassland Drainage Area. The Grassland Area Farmers are a participant in these processes.

### **Discharge during Water Year 2013**

Table 1 sets forth discharges from the Grassland Drainage Area for the period Water Year 1995 (October 1994 through September 1995) through Water Year 2013. The Grassland Bypass Project began in Water Year 1997. The volume of drainage has been reduced significantly compared to pre-project (1995) discharges:

- Discharge volume (acre feet) has been reduced by 82%
- Selenium load has been reduced by 95%
- Salt load has been reduced by 77%
- Boron load has been reduced by 68%

Figure 1 shows this historic discharge (acre feet) and selenium concentration from the Grassland Drainage Area since 1995. As expected, the discharged volume has reduced significantly since the project implementation. However, the concentration of selenium has also reduced – by almost 70% since the beginning of the project. The cause of this selenium concentration reduction is likely the combined result of water delivery infrastructure improvements, irrigation system modernization, and reuse activities on the San Joaquin River Improvement Project.

Selenium load discharged from the Grassland Drainage Area compared with 2013 monthly targets in WDR 5-01-234 are shown in Figure 2. Figure 3 shows the 2013 discharged load along with historic discharges and the “glidepath” in the Use Agreement incorporating the load values from the August 4, 2005 request for revision of the TMML for selenium. Figure 4 shows an estimate of the impact of control activities that occurred during Water Year 2013. Conservation, which includes improved irrigation application, tiered water pricing, tailwater controls, the tradable loads program, and seasonal land fallowing accounted for a reduction of approximately 7,700 pounds of selenium from historic loads. Reuse and treatment, which includes recycling, use of subsurface drainage water on salt tolerant crops and displacement of subsurface drainage water such as for wetting of roadways for dust control, resulted in a 4,400 pound reduction in discharge in Water Year 2013. The remaining 600 pounds was discharged to the San Joaquin River through the Grassland Bypass Project.

The water quality objective for the San Joaquin River at Crows Landing is a 5-ppb 4-day average selenium concentration. This objective was not exceeded in all months through June 26, 2013 and is not expected to have been exceeded the remainder of the year.

### **Meeting Water Quality Objectives within Grassland Area Channels**

The Regional Board has established a two parts per billion monthly average selenium objective for water delivery channels within the wetland areas. Previous long term drainage management plans discussed the activities within the Grassland Drainage Area to keep their agricultural subsurface drainage out of those channels to meet this water quality objective. The Grassland Area Farmers have caused the objective to be exceeded on a few occasions. During 1997 and 1998 storm water discharges caused by surface runoff from heavy rainfall and discharge from coastal streams overwhelmed the agricultural drainage system and flowed into wetland channels, violating the objectives.

In February of 2005, significant storm events required the Grassland Area Farmers to divert water through the Agatha Canal in accordance with their Storm Water Management Plan, exceeding the objective for several days. No storm-related diversions into wetland channels by the Grassland Area Farmers have been made since that time.

The Grassland Area Farmers continue to work with the Regional Board to identify and manage discharges to wetland water delivery channels from outside of the Grassland Drainage Area that may cause exceedances of the selenium water quality objective within the wetland areas. The attached Figures 5 and 6 show monthly average selenium concentrations for four sites within the wetland area. Exceedances within the last 82 months have shown marked improvements and low exceedance rates (see Table 2).

### **Tools to be used For Long Term Drainage Management**

Conservation, reuse and treatment, and river discharge will continue to be the main tools available to the Grassland Area Farmers during the next several years.

During Water Year 2001, Panoche Drainage District on behalf of the other Grassland Area Farmers implemented the San Joaquin River Water Quality Improvement Project (SJRIP). Table 3 shows the usage of subsurface drainage water within the SJRIP area in Water Year 2013, including drain water reused on the newly expanded area. The project resulted in a displacement of 3,500 pounds of selenium. The SJRIP is a multi-phase project, which was initiated with the purchase of 4,000 acres of land in the year 2000 within the Grassland Drainage Area by Panoche Drainage District. During 2008, an additional 2,000 acres were purchased, of which 480 acres were developed for reuse. Currently the total developed reuse area is approximately 5,500 acres. Additionally, the Grassland Area Farmers are in the process of designing a number of infrastructure projects that will increase the operational flexibility and efficiency of the SJRIP. Future phases call for installing subsurface tile drainage systems in the remainder of the SJRIP area to maintain a salt balance within the soil and for disposal of the collected water through treatment and salt disposal options. A portion of these future phases are budgeted in the Prop 50 \$25 million grant and federal appropriations awarded to Panoche Drainage District and the Water Authority. Other funds within this grant will be used to investigate drainage treatment options for final salt disposal.

### **Future Needs**

In order to maintain the drainage control strategy for the Grassland Area Farmers, there are several needs. They are as follows:

- ◆ The completion of the SJRIP Project including planting and construction of subsurface drainage systems.
- ◆ Purchase of additional SJRIP lands of up to 2000 acres for planting of additional cropping to be irrigated with subsurface drainage water.
- ◆ Implementation of treatment and disposal of salt from the SJRIP lands. The U.S. Bureau of Reclamation has begun construction of a demonstration-scale treatment

plant within the SJRIP and will receive its source water from tile systems within the SJRIP.

- ◆ Retirement of land could be part of the ultimate solution to the problem within the Grassland Drainage Area. The Grassland Area Farmers have developed a land retirement policy that was identified and described in the September 30, 1998 Long Term Drainage Management Plan. In addition to this plan, Broadview Water District and Widren Water District have recently been purchased and have been fallowed. Other lands within the Grassland Drainage Area are also being considered for fallowing.
- The Grassland Area Farmers and other local interests have been participating with the USBR in their San Luis Drainage Feature Re-Evaluation Program. The goal of the Grassland Area Farmers is to develop local projects that can be implemented to provide drainage service that meets regulatory requirements, including the selenium load reduction targets, while still maintaining a viable agricultural economy.
- The Grassland Area Farmers continue to work with the USBR, other local stakeholders and interested parties to resolve long standing drainage issues. The main component would be full implementation of the Westside Regional Drainage Plan.

### **Recent Developments**

There are four recent and on-going developments related to efforts of the Grassland Area Farmers to meet the regulatory requirements of the Waste Discharge Permit and the Use Agreement. The first two were indicated in the 2004 annual report.

- ◆ The Westside Regional Drainage Plan has been developed by the San Joaquin River Exchange Contractors Water Authority, the Broadview Water District, Panoche Water District and Westlands Water District. This process is meant to complement the USBR San Luis Drain Feature Re-evaluation process and to help resolve longstanding drainage issues within the area. The Grassland Area Farmers are aggressively pursuing funding opportunities to implement the Westside Regional Drainage Plan, and have met on a number of occasions with the USBR to move this plan forward. A number of state and federal grants have helped significantly in funding portions of this plan.
- ◆ The San Joaquin River Water Quality Management Group was formed out of the "UOP Discussions" between statewide water interests and Delta interests to develop a plan to meet Vernalis salinity objectives. There are many components to this plan that is being developed, one of the major ones being the future reductions of discharge from the Grassland Drainage Area.
- ◆ In December, 2006 the Grassland Area Farmers complied with the requirement in the Use Agreement that a Mud Slough Compliance Plan be developed by 2006 to meet Mud Slough water quality objectives. This letter also outlined a process to continue discharges to the San Joaquin River beyond the term of the then-current Use Agreement, which expired in December, 2009.

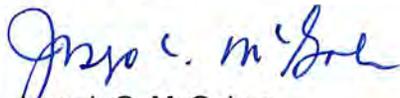
- ◆ In the summer of 2007 the Grassland Area Farmers initiated discussions with stakeholders regarding a time extension of the Grassland Bypass Project. The discharge of selenium and salinity has significantly reduced since the initiation of the Grassland Bypass Project. The Westside Regional Drainage Plan has been developed and significant funding has been obtained to implement parts of the plan. However, the final funding and technical steps are not yet in place and therefore the Grassland Area Farmers have requested up to a 10 year extension of the Use Agreement. The EIR for this extension was approved by the San Luis & Delta-Mendota Water Authority on October 8, 2009 and the Record of Decision by the US Bureau of Reclamation was issued on December 21, 2009 with a subsequent signing of the new 2010-2019 Use Agreement. This action required a Basin Plan Amendment. The Basin Plan Amendment was approved by the Central Valley Regional Board on May 27, 2010 and by the State Water Resources Control Board on October 5, 2010. The Grassland Area Farmers are currently meeting with Regional Board staff on the development of revised Waste Discharge Requirements for the Project which are expected to blend in requirements under the Irrigated Lands Regulatory Program.

### **Conclusion**

The Grassland Area Farmers have demonstrated their commitment to the project as evidenced by the accomplishments as detailed in this report. They are also committed to the goals and milestones in the new 2010-2019 Use Agreement. This will include maintaining efforts to meet monthly and annual selenium targets while at the same time aggressively pursuing the long term solutions and funding that will be necessary to meet these future requirements.

If you should have any questions please feel free to call. I can be reached at (559) 582-9237.

Very Truly Yours,



Joseph C. McGahan  
Drainage Coordinator  
Grassland Area Farmers

JCM/jcl

Cc: David Murillo, USBR Sacramento  
Michael Jackson, USBR Fresno  
Dan Nelson, SL&DMWA  
Grassland Basin Drainage Steering Committee  
Margaret Wong, RWQCB, Rancho Cordova

**Table 1**  
**Discharge Comparison from Grassland Drainage Area**  
**Values October thru September**

|                 | WY 95   | WY 96   | WY 97   | WY 98   | WY 99   | WY 00   | WY 01   | WY 02   | WY 03   | WY 04   |
|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Volume (AF)     | 57,574  | 52,978  | 39,856  | 49,289  | 32,317  | 31,342  | 28,235  | 28,358  | 27,345  | 27,640  |
| Se (lbs)        | 11,875  | 10,034  | 7,096   | 9,118   | 5,124   | 4,603   | 4,377   | 3,939   | 4,032   | 3,860   |
| Salt (tons)     | 237,530 | 197,526 | 172,602 | 213,533 | 149,081 | 139,303 | 142,415 | 128,411 | 126,500 | 121,138 |
| B (1,000 lbs)   | 868     | 723     | 753     | 983     | 630     | 619     | 423     | 544     | 554     | 530     |
| Se (ppm)        | 0.076   | 0.070   | 0.066   | 0.068   | 0.058   | 0.054   | 0.057   | 0.051   | 0.054   | 0.051   |
| Salt (µmhos/cm) | 4,102   | 3,707   | 4,306   | 4,308   | 4,587   | 4,420   | 5,016   | 4,503   | 4,600   | 4,358   |
| Boron (ppm)     | 5.5     | 5.0     | 7.0     | 7.3     | 7.2     | 7.3     | 5.5     | 7.1     | 7.5     | 7.1     |

|                 | WY 05   | WY 06   | WY 07  | WY 08  | WY 09  | WY 10  | WY 11  | WY 12  | WY 13  | Reduction from<br>WY 95 to WY 13 |
|-----------------|---------|---------|--------|--------|--------|--------|--------|--------|--------|----------------------------------|
| Volume (AF)     | 29,957  | 25,995  | 18,531 | 15,665 | 13,166 | 14,529 | 18,513 | 10,486 | 10,258 | 82%                              |
| Se (lbs)        | 4,305   | 3,563   | 2,554  | 1,736  | 1,264  | 1,577  | 2,067  | 733    | 641    | 95%                              |
| Salt (tons)     | 138,908 | 119,646 | 79,094 | 66,254 | 55,556 | 67,661 | 87,537 | 38,398 | 54,674 | 77%                              |
| B (1,000 lbs)   | 585     | 539     | 278    | 269    | 233    | 315    | 440    | 245    | 282    | 68%                              |
| Se (ppm)        | 0.053   | 0.050   | 0.051  | 0.041  | 0.035  | 0.040  | 0.041  | 0.026  | 0.023  |                                  |
| Salt (µmhos/cm) | 4,611   | 4,577   | 4,244  | 4,206  | 4,196  | 4,631  | 4,702  | 3,641  | 5,300  |                                  |
| Boron (ppm)     | 7.2     | 7.6     | 5.5    | 6.3    | 6.5    | 8.0    | 8.7    | 8.6    | 10.1   |                                  |

Note: WY 97, 98, & 05 include discharges through Grasslands

Note: GAF quality data used where RWQCB data was missing or pending.

**Table 2**  
**Exceedance of 2 ppb Monthly Mean Water Quality Objective**

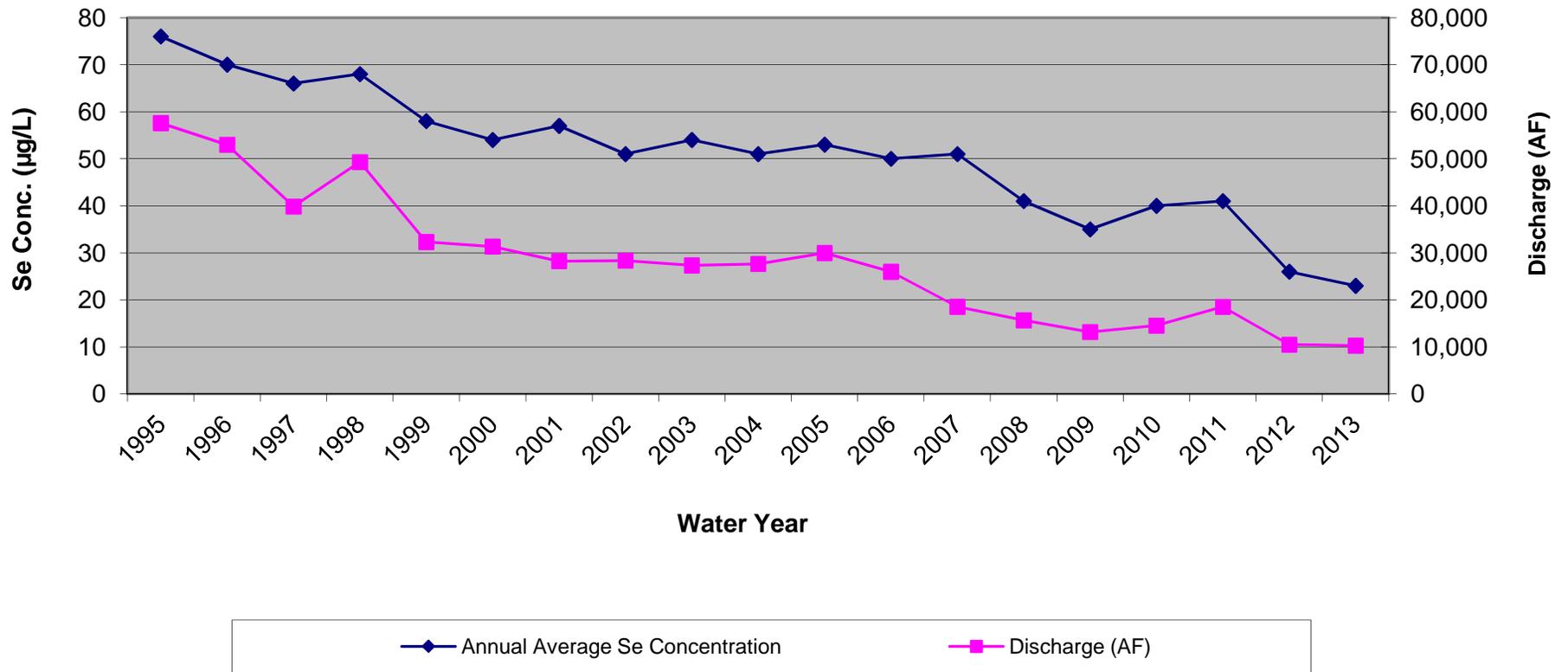
|                                                                                      | Site |     |     |     |
|--------------------------------------------------------------------------------------|------|-----|-----|-----|
|                                                                                      | J    | K   | L2  | M2  |
| % months exceeding 2 ppb monthly mean selenium objective Oct 1996 through Aug 2006   | 19%  | 13% | 32% | 13% |
| % months exceeding 2 ppb monthly mean selenium objective Sept 2006 through June 2013 | 2%   | 2%  | 10% | 0%  |

Months exceeding 2 ppb but with no flow were excluded from calculations

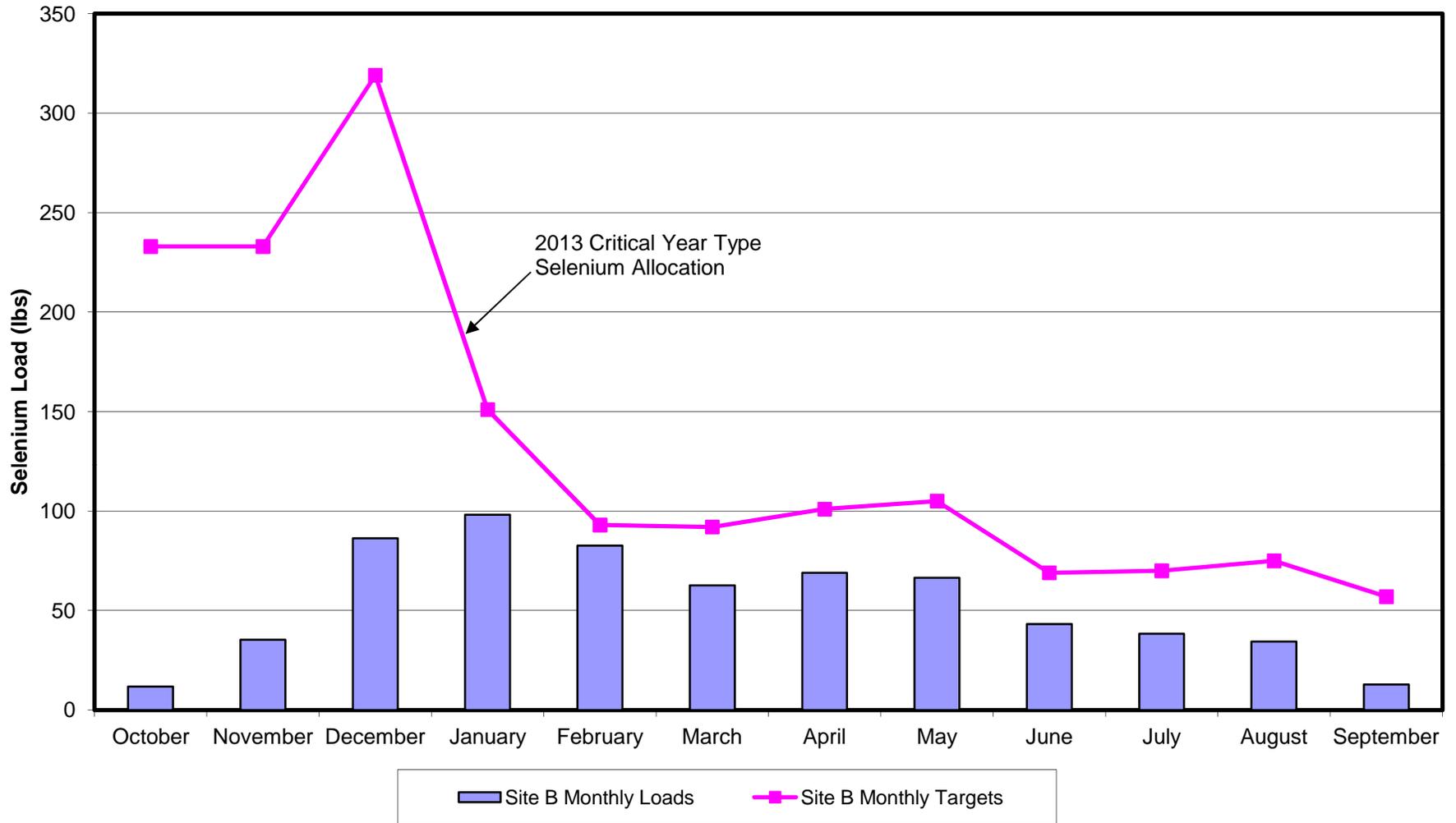
**Table 3**  
**San Joaquin River Improvement Project**  
**Water Year 2013**

| <b>MONTH</b>  | <b>WATER APPLIED (AF)</b> |              |               | <b>SELENIUM<br/>LBS</b> | <b>SALT<br/>TONS</b> | <b>BORON<br/>LBS</b> |
|---------------|---------------------------|--------------|---------------|-------------------------|----------------------|----------------------|
|               | <b>DRAIN</b>              | <b>OTHER</b> | <b>TOTAL</b>  |                         |                      |                      |
| <b>OCT 12</b> | 1,921                     | 714          | 2,635         | 163                     | 7,423                | 35,629               |
| NOV 12        | 1,765                     | 90           | 1,855         | 223                     | 7,214                | 31,622               |
| DEC 12        | 1,564                     | 70           | 1,634         | 206                     | 5,792                | 27,612               |
| <b>JAN 13</b> | 1,649                     | 0            | 1,649         | 181                     | 8,692                | 43,887               |
| FEB           | 1,703                     | 0            | 1,703         | 179                     | 8,311                | 40,442               |
| MAR           | 2,332                     | 0            | 2,332         | 269                     | 8,334                | 37,426               |
| APR           | 2,110                     | 0            | 2,110         | 316                     | 6,010                | 27,092               |
| MAY           | 2,378                     | 317          | 2,695         | 418                     | 10,957               | 51,118               |
| JUN           | 3,582                     | 540          | 4,122         | 541                     | 18,927               | 68,762               |
| JUL           | 2,398                     | 357          | 2,755         | 395                     | 10,498               | 58,985               |
| AUG           | 2,489                     | 128          | 2,617         | 362                     | 10,773               | 60,712               |
| SEP           | 2,236                     | 544          | 2,780         | 252                     | 10,019               | 51,573               |
| <b>TOTAL</b>  | <b>26,127</b>             | <b>2,760</b> | <b>28,887</b> | <b>3,505</b>            | <b>112,950</b>       | <b>534,860</b>       |

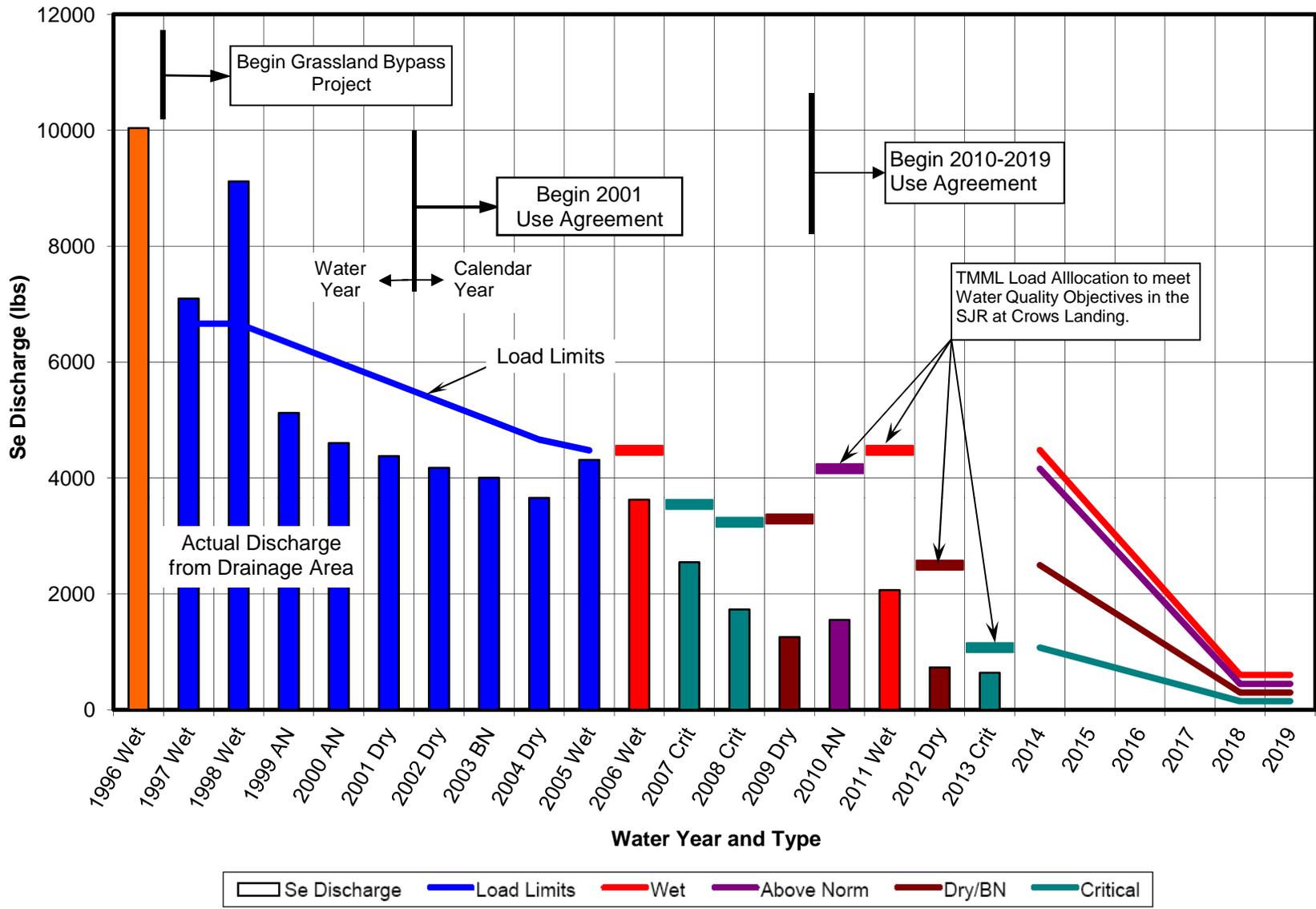
**Figure 1**  
**Grassland Bypass Project**  
**Annual Average Selenium Concentration**



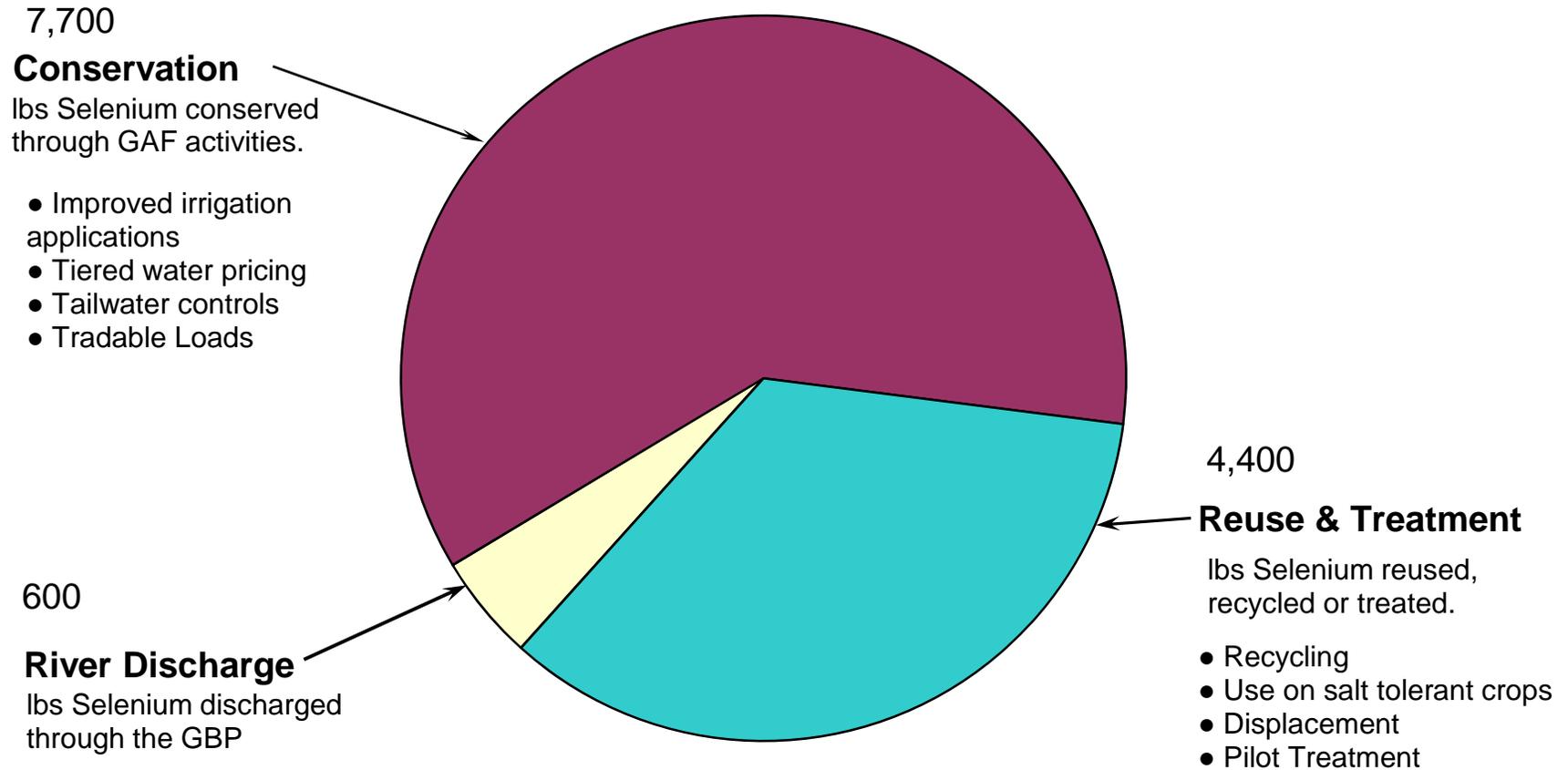
**Figure 2**  
**Discharge from the Grassland Drainage Area**  
**October 2012 through September 2013**



**Figure 3**  
**Grassland Drainage Area**  
**Selenium Discharge and Targets**

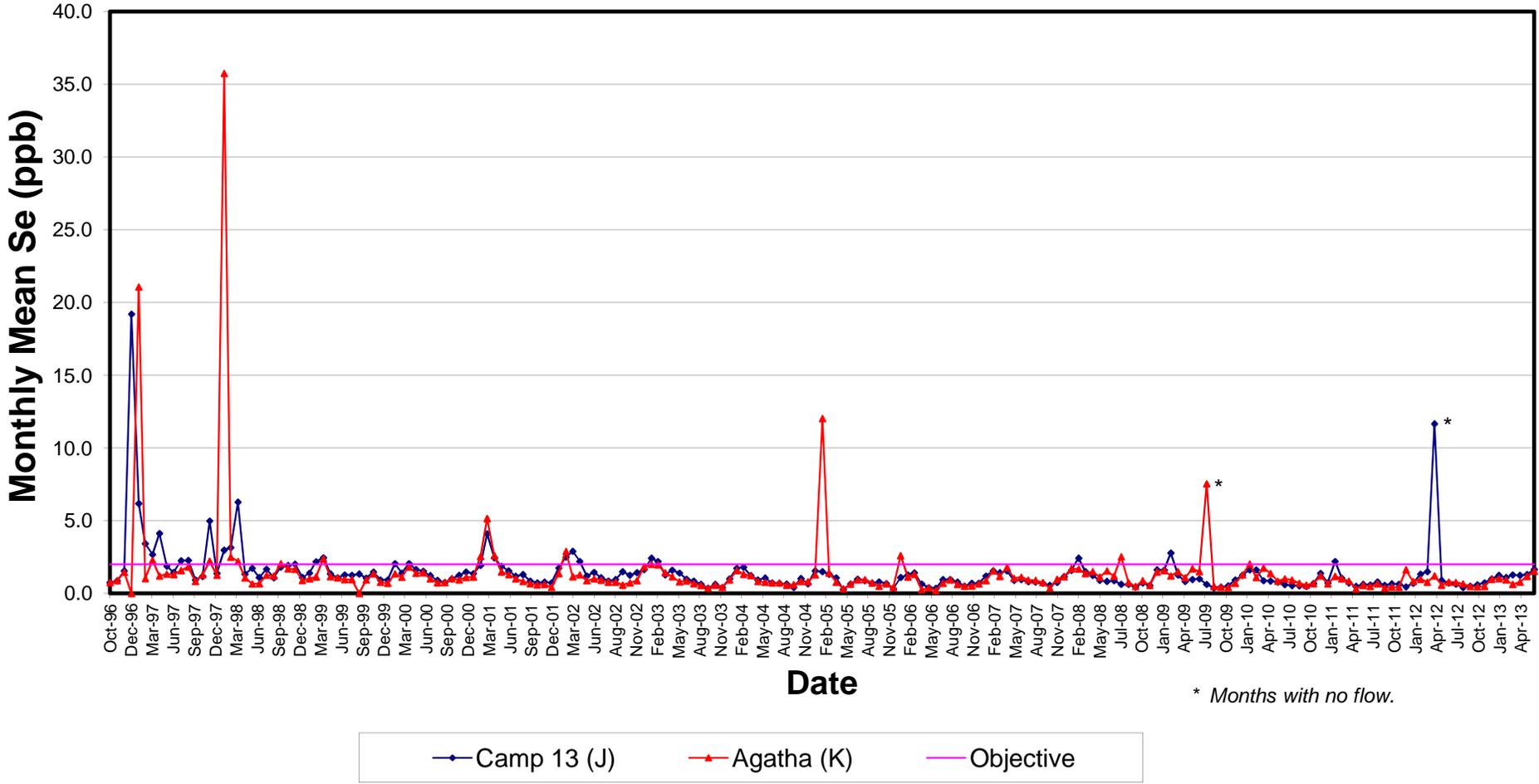


**Figure 4**  
**Historic Drainage Water (lbs selenium)**  
**57,000 AF 12,700 lbs Se 240,000 Tons Salt**

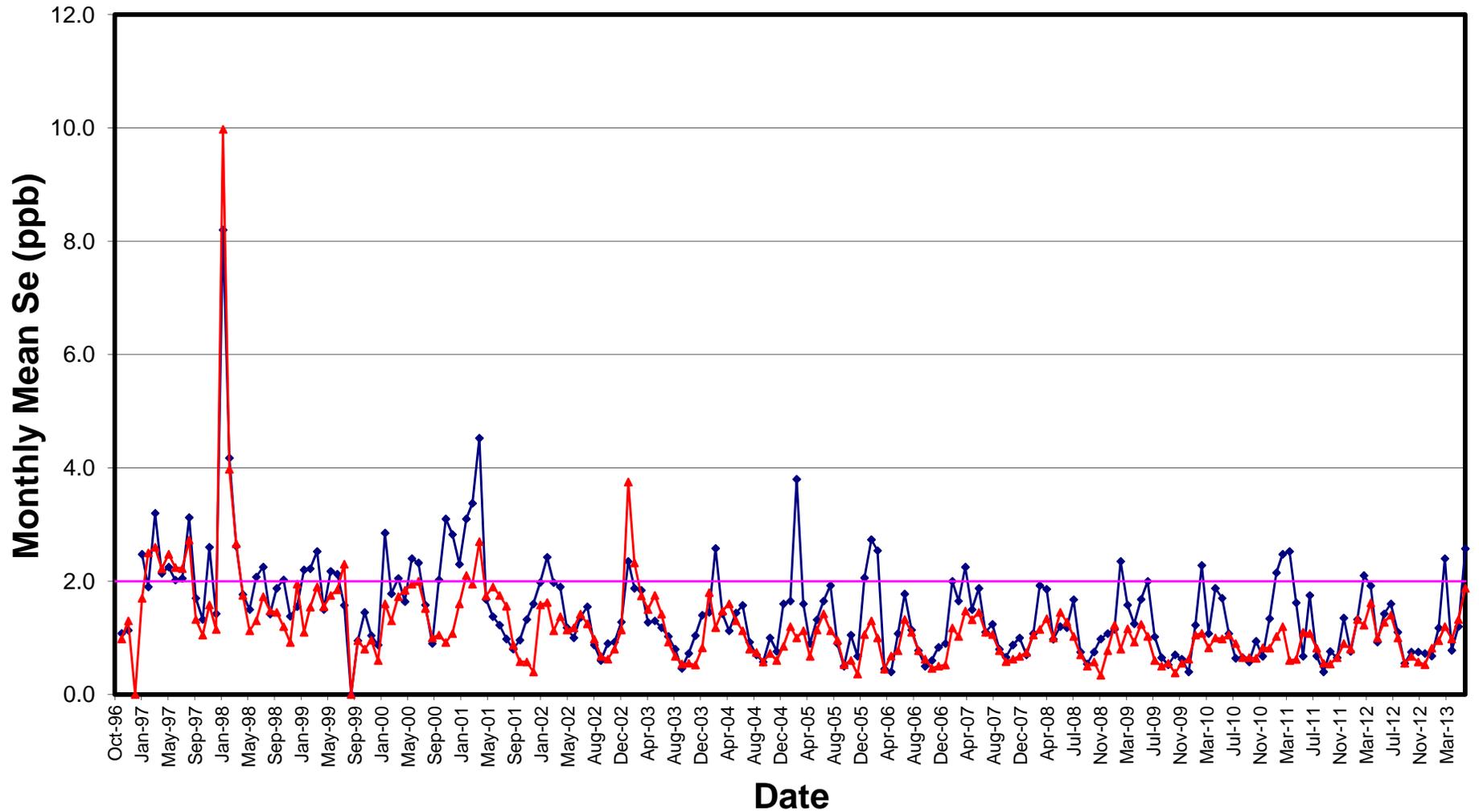


**2013 Drainage Management**

**Figure 5**  
**Camp 13 (J) and Agatha Canal (K)**



**Figure 6**  
**San Luis Canal at Splits (L2) - Santa Fe Canal at Splits (M2)**





David Murillo, Regional Director  
US Bureau of Reclamation  
Mid-Pacific Region  
Federal Office Building, MP-100  
2800 Cottage Way  
Sacramento, CA 95825-1898

DRAFT 12-26-13

Subject: Components of Plan to meet Selenium Loads in Years 6-10 (2015-2019)

The Agreement for Continued Use of the San Luis Drain for the period January 1, 2010 through December 31, 2019, Agreement No. 10-WC-20-3975, executed December 22, 2009, contains a requirement in paragraph III.G.1. which states "By the end of Year Four (2013), a Report to the Oversight Committee provided at a noticed meeting regarding the Draining Parties' plan to meet loads in Years Six through Ten (2015-2019).

The Grassland Bypass Project operates under Waste Discharge Requirements (WDR) issued to the San Luis & Delta-Mendota Water Authority and the U S Bureau of Reclamation. Under the WDR the Grassland Basin Drainers must manage selenium from all sources, including flood flows, prior to transition to a stormwater discharge program. The most problematic period will be the non-irrigation season in January through April. Per the attached figure this amounted to 8,800 AF in 2011, a wet year. The plan will need to address how to reduce this to basically 0 flow in 2018 and 2019. Below are the components included in the plan:

- Consistent with all required management practices and any mitigation measures, apply water to the San Joaquin River Improvement Project (SJRIP) reuse area in January through April. Increased acreage will facilitate this measure.
- Create an area in the old Broadview Water District (BVWD) for springtime flows. The area could be planted to a winter crop like wheat or let natural vegetation grow. These flows could be captured easily from the Panoche Davidson Drain and from Firebaugh Canal Water District (FCWD). Temporary pumps may be needed to pump the water. Assuming sufficient flows in the Davidson Drain are present, ~1,700 acres in northwestern BVWD could be developed, allowing up to 850 AF at 6" per acre. Diverting flows from FCWD to BVWD would require pump stations and pipelines with significant lift. The pipeline would have to cross Nees Avenue which would likely require a jacked crossing.
- Regulate sumps to delay discharges in the springtime flow period (Jan-April); This would need to be coordinated with planting schedules.

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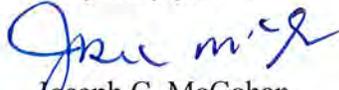
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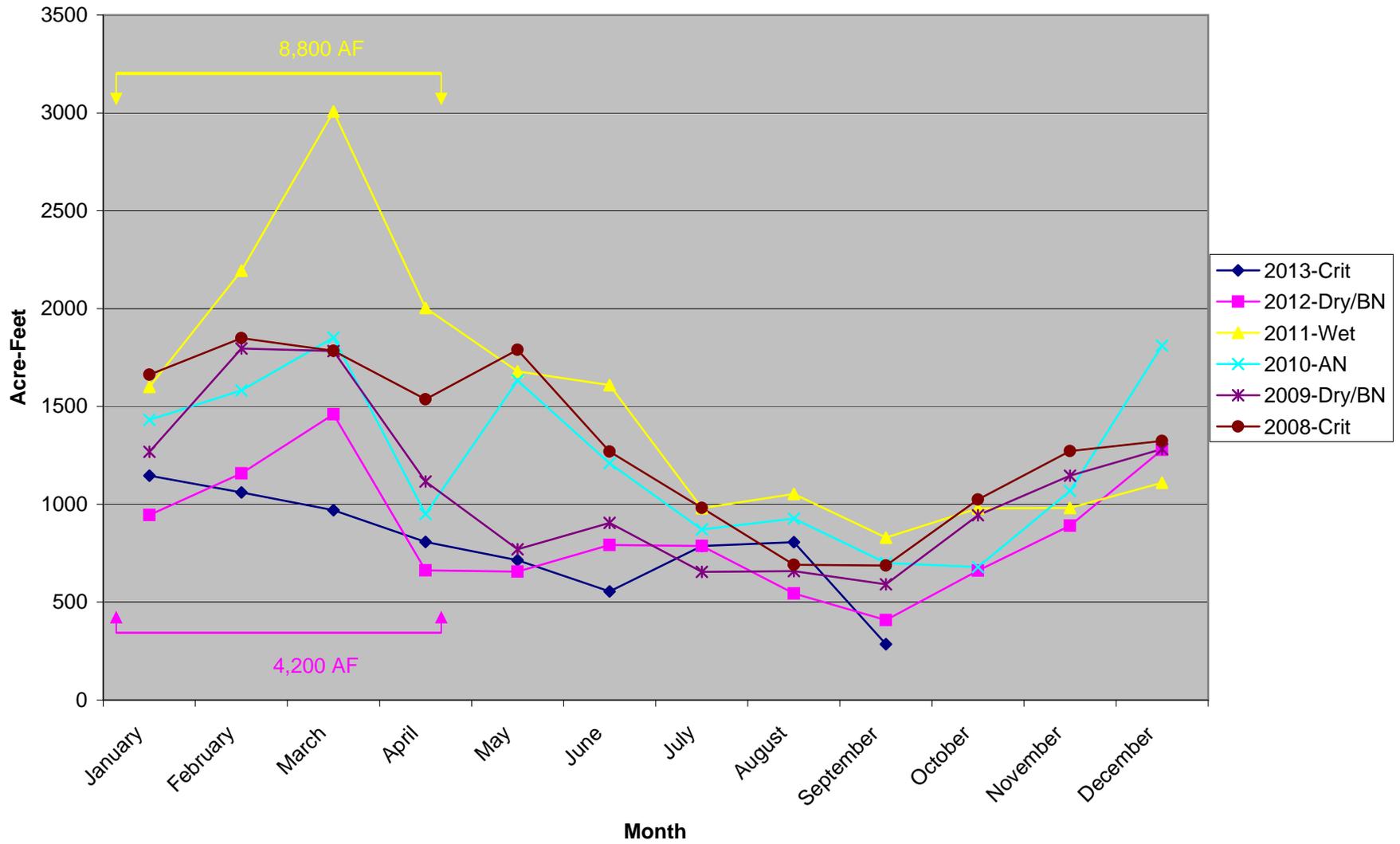
- Recirculate drainage into water supply for late winter and early spring irrigation demand. This may have a variable effect, depending upon cropping pattern and timing of irrigation.
- Shallow groundwater pumping to provide upper aquifer storage capacity which could delay the discharge of drainage during the winter.
- Implement additional measures to reduce drainage flows during the pre-irrigation season, e.g., increased use of high-efficiency irrigation systems and delivery-based pricing during the pre-irrigation period.
- Treatment for salt removal from the SJRIP reuse area. This aspect addresses the long term sustainability of the reuse areas but is not expected to directly increase winter reuse capacity.
- Continued measures to reduce seepage losses from irrigation delivery and drainage systems (e.g., lining or piping of facilities). These types of facilities would require funding.

The attached table outlines the anticipated reductions to meet these requirements. The reduction for some of the items are unknown at the current time but together are anticipated to provide the required amounts.

Very truly yours,

  
Joseph C. McGahan  
Drainage Coordinator

### Site B Flow



Reductions to meet January-April Drain Flows

Acre Feet

|                                       |      |       |          |             |      |
|---------------------------------------|------|-------|----------|-------------|------|
| Apply to reuse area                   | 6700 | acres | 2.5      | " per Month | 5583 |
| Broadview                             | 1700 | acres | 2.5      | " per Month | 1417 |
| Regulate sumps                        |      |       |          |             | *    |
| Recirculate                           |      |       |          |             | 500  |
| Shallow Groundwater Pumping           |      |       |          |             | *    |
| Reduce pre-irrigation                 |      |       |          |             | *    |
| Treatment                             |      |       |          |             | *    |
| Irrigation/Drainage Seepage Reduction |      |       |          |             | *    |
|                                       |      |       | Subtotal |             | 7500 |

Needed 8800

Peak Month - March

|                                       |      |       |          |             |      |
|---------------------------------------|------|-------|----------|-------------|------|
| Apply to reuse area                   | 6700 | acres | 3.5      | " per Month | 1954 |
| Broadview                             | 1700 | acres | 3.5      | " per Month | 496  |
| Regulate sumps                        |      |       |          |             | *    |
| Recirculate                           |      |       |          |             | 120  |
| Shallow Groundwater Pumping           |      |       |          |             | *    |
| Reduce pre-irrigation                 |      |       |          |             | *    |
| Treatment                             |      |       |          |             | *    |
| Irrigation/Drainage Seepage Reduction |      |       |          |             | *    |
|                                       |      |       | Subtotal |             | 2570 |

Needed 3000

\* Specific amounts not determined

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ATTACHMENT A TO ORDER R5-2014-XXXX  
INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS FOR  
SAN LUIS & DELTA-MENDOTA WATER AUTHORITY  
AND  
United STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SURFACE WATER DISCHARGES FROM THE  
GRASSLAND BYPASS PROJECT  
FRESNO AND MERCED COUNTIES

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## I. Overview

This attachment to Waste Discharge Requirements for Surface Water Discharges from the Grassland Bypass Project, Order R5-2014-XXXX (referred to as the “Order”) is intended to provide information regarding the rationale for the Order, general information on surface monitoring that has been conducted, and a discussion of this Order’s elements that meet required state policy.

## II. Introduction

The Grassland Bypass Project (GBP) addresses the transport of subsurface drainage, as well as stormwater runoff, from a portion of the agricultural lands in the western portion of the San Joaquin River (SJR) Basin. Soils on the west side of the SJR Basin are of marine origin and are high in selenium and salts. Major land uses in the watershed include agriculture and managed wetlands. Irrigation is necessary for nearly all crops grown commercially in the watershed. ~~Supplied irrigation~~ ~~water applied~~ without adequate drainage causes the shallow or perched water table to rise, leading to waterlogging and evapoconcentration of salts and trace elements in the crop root zone. Adding ~~more~~ irrigation water to dissolve and leach these salts and trace elements into the shallow groundwater is necessary to maintain the salt balance in the crop root zone. Drainage tiles and associated sumps are used to lower the water table. The subsurface drainage from this area typically contains high concentrations of dissolved solids, selenium and boron.

The Grassland watershed is a valley floor sub-basin of the San Joaquin River Basin, covering an area of approximately 370,000 acres. The Grassland Drainage Area (GDA), about 97,400 acres, is located within the Grassland watershed, roughly between Los Banos to the north and Mendota to the south (Figure 1). The GDA is the primary source of selenium in the watershed area. The GBP routes subsurface drainage and surface runoff from the GDA to a portion of the San Luis Drain, then to Mud Slough (north), a point about six miles upstream of the San Joaquin River confluence. The ~~GBP~~ ~~Grasslands Bypass Project~~ effectively allows ~~agricultural~~ drainage water ~~from the GDA~~ to “bypass” wetland supply channels, thereby, avoiding the discharge of high levels of selenium to managed wetlands, where waterfowl could be impacted.

Phase I of the GBP went into operation in 1996 and Waste Discharge Requirements (WDRs) were first issued in 1998. Updated WDRs for Phase II of the GBP were adopted in 2001. Since then, the ~~Regional~~ ~~Board~~ has adopted general waste discharge requirements under the Irrigated Lands Regulatory Program (ILRP), which include provisions related to surface water discharges from irrigated lands. This update of the ~~Order-2001 WDR~~ incorporates changes to the Basin Plan, modifications to the GBP (Phase III) and elements of other ILRP WDRs.

There are differences between this Order and the general WDRs issued by the ILRP for the rest of the Central Valley. While the ILRP general orders address both surface water and groundwater, this ~~order~~ ~~Order~~ specifically addresses surface water discharges. Discharges to groundwater from the area served by the GBP will be regulated in the future through a separate order or orders.

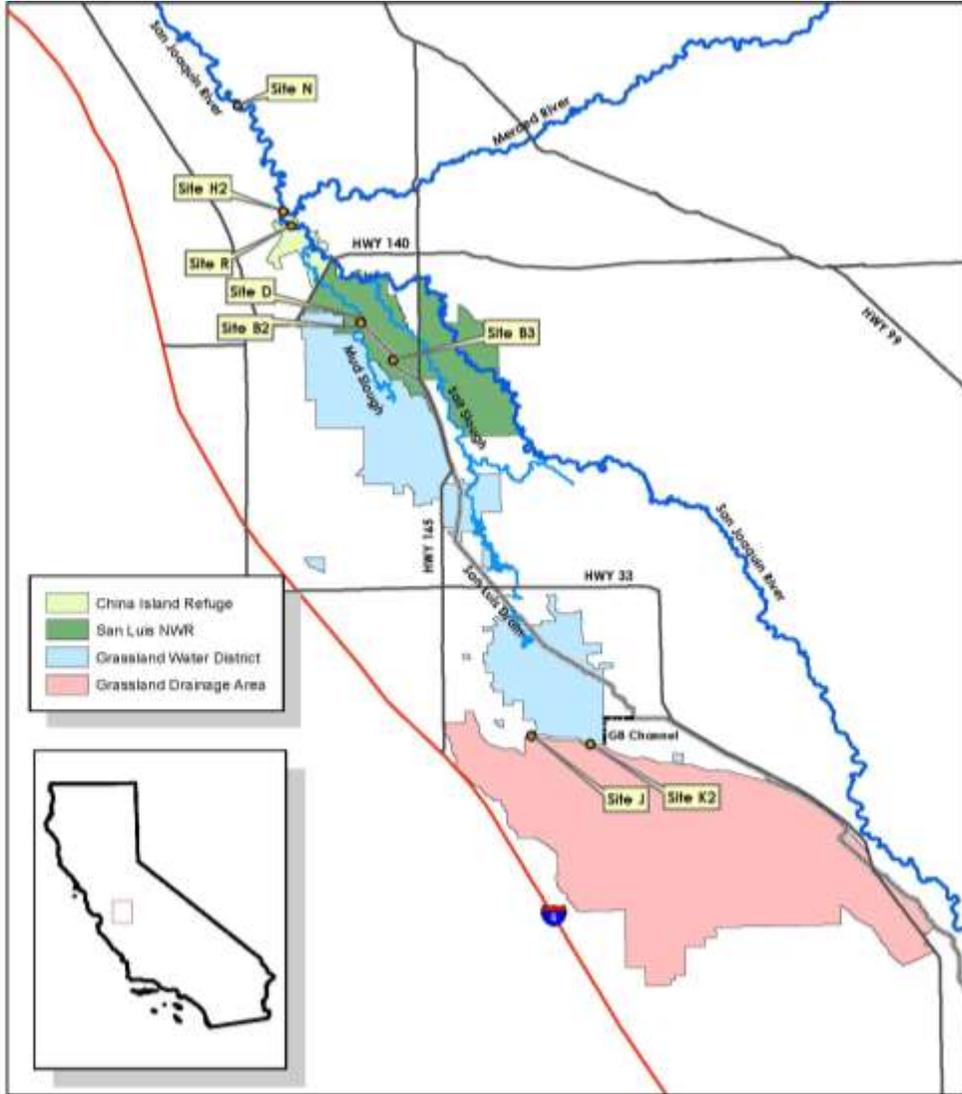
The GBP WDRs are issued to the U.S. Bureau of Reclamation, owner of the San Luis Drain (Drain), and to the San Luis & Delta-Mendota Water Authority that represents member districts within the GDA. ~~The member districts have formed a Members of the San Luis & Delta-Mendota Water Authority, a Joint Power Authority known as the Grassland Area Famers (GAF) to,~~ operate the GBP.

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### III. Description of the Grassland Bypass Project

Seven contiguous member districts<sup>1</sup> of the San Luis & Delta-Mendota Authority (Authority) are located within the GDA. These districts supply or transport irrigation water and/or manage subsurface drainage within to the Grassland Area Farmers (GAF) in the GDA. Figure 2 is a map of the GBP and GAF member locations.

Figure 1. General Location Map and Monitoring Sites



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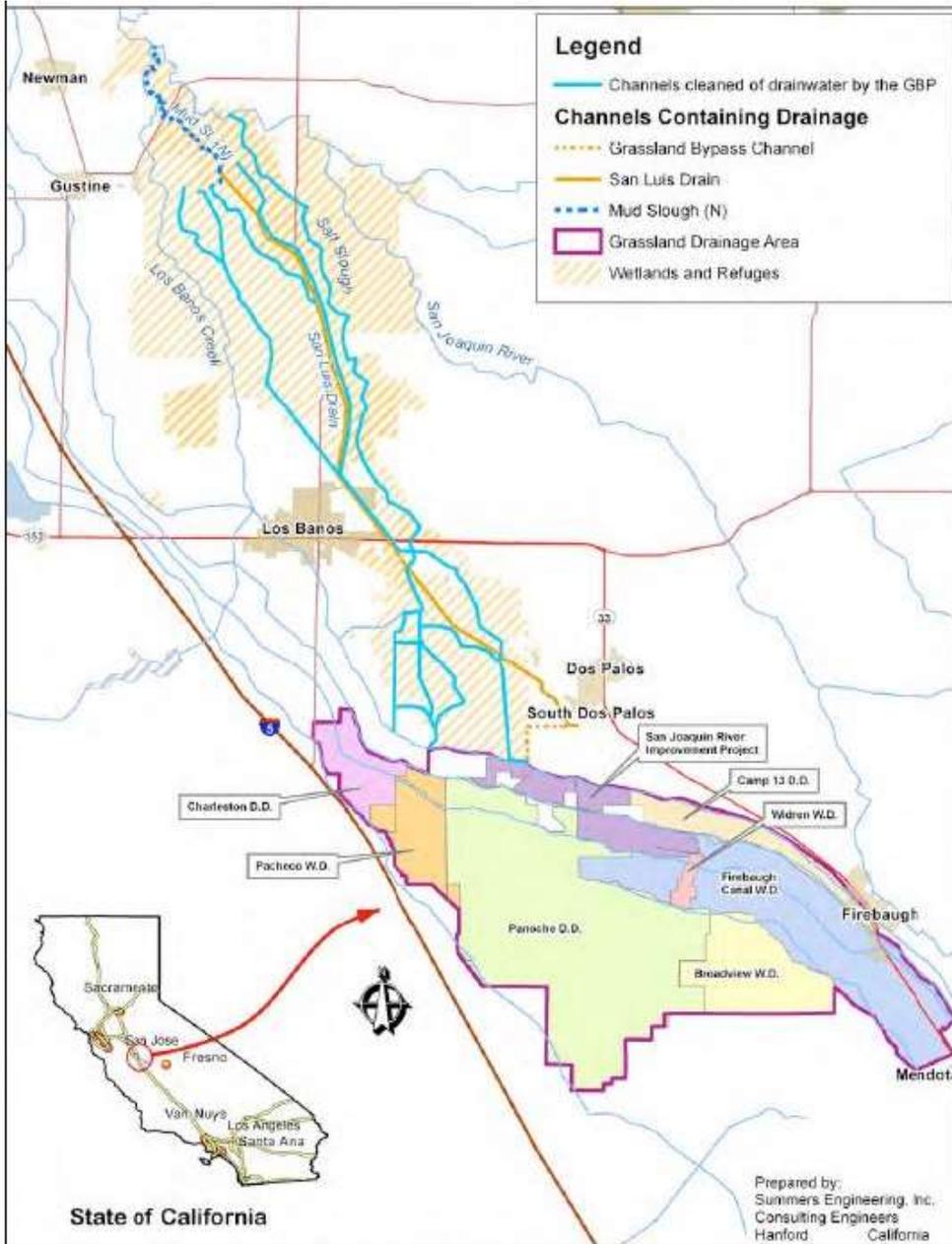
## Grassland Bypass Project

### 2014 Monitoring and Reporting Plan Sites



Grassland Bypass Project  
NAD 1983 California Zone 10  
U.S. Bureau of Reclamation

**Figure 2: Map of Grassland Bypass Project and Grassland Area Farmers**  
(from Grassland Bypass Project Annual Report 2008-2009)



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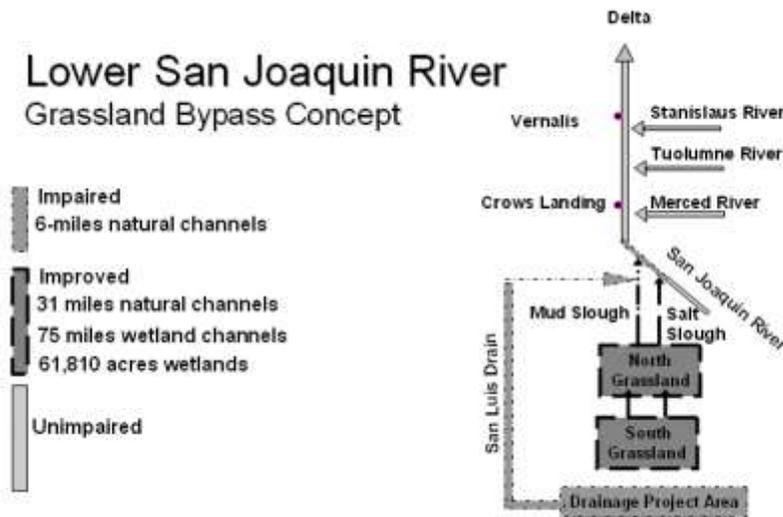
Subsurface agricultural drainage from approximately 38,700 acres in the ~~GDA~~Grassland Drainage Area is routed to the Drain through the Grassland Bypass Channel. From there, it travels 28 miles to the Drain's terminus and discharges to Mud Slough (north). During most of the year, the discharge primarily consists of subsurface agricultural drainage that is high in salts, selenium, boron, and other constituents. The GBP is also designed to handle local stormwater runoff. The Drain has been blocked above the Grassland Bypass Channel at ~~Russell Avenue~~Creek 49 to prevent the introduction of other flows.

The GBP discharges the subsurface drainage to Mud Slough (north) at a point six miles upstream of the San Joaquin River confluence. Historically, this subsurface agricultural drainage reached the San Joaquin River ~~via Mud Slough (north) or Salt Slough, but was routed~~ through various channels in the Grassland Water District (GWD) to Mud Slough (north) and Salt Slough. These channels were also used to supply water to wetlands within the GWD. The dual use of the channels as both drainage and supply canals limited the ability to provide good quality water to the wetlands. The GBP removes the GDA subsurface agricultural drainage and routes it around the wetland areas using several ditches and through a portion of the Drain. Figure 3 shows the conceptual model for the GBP.

When the GBP began, it was known that a 6-mile portion of Mud Slough (north) would be impaired for a time in exchange for permanent improvement of the water supply channels serving wetlands. The GBP temporarily allows drainage to exit the basin, subject to progressively decreasing loads of selenium while management practices to control selenium and adequate in-basin drainage management facilities were developed. The performance goals and time schedules to achieve the selenium water quality objectives for the San Joaquin River were incorporated as part of the Basin Plan. This Order allows for the implementation of further practices and treatment to meet the water quality objectives stated in the Basin Plan.

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Figure 3: GBP Conceptual Model



Comment [SCC-1071]: This diagram is not clear and should be re-drawn.

During major storm events, general surface runoff and stormwater flows may exceed the 150 cfs capacity of the Grassland Bypass Channel. It is not possible during these major events to separate agricultural drainage from surface runoff and stormwater flows. During these major events, all of the commingled surface runoff, storm water flows and agricultural drainage may be diverted temporarily to the Grassland Water District channels, ditches and sloughs that carried drainage water and stormwater runoff to the San Joaquin River prior to the GBP implementation. The procedures and monitoring

required for such an event are outlined in “A Storm Event Plan for Operating the Grassland Bypass Project”<sup>2</sup> and in revised Monitoring and Reporting Program Order WDR 5-01-234<sup>3</sup>, and further detailed in section IV.9 of the MRP Order.

#### IV. History of the Grassland Bypass Project

##### Phase I

The original GBP proposal had a maximum of 5-years for use of a portion of the Drain to convey subsurface drainage through the GWD and adjacent area. The original GBP was implemented through an “Agreement for Use of the San Luis Drain”<sup>4</sup> between the Bureau and the Authority for the period of 1 October 1996 to 30 September 2001 (Water Years<sup>5</sup> 1997 to 2001). A Finding of No Significant Impact was adopted by the Bureau for the original project.

In 1996 the Central Valley Regional Water Quality Control Board (Central Valley Water Board) amended the *Water Quality Control Plan, Third Edition, for the Sacramento and San Joaquin River* (Basin Plan) to address selenium in the San Joaquin River, Salt Slough, and Mud Slough. The amendment indicated that WDRs would be used to regulate discharges and included time schedules, performance goals and water quality objectives. The control actions were designed to achieve the following in the order of priority:

1. Separate subsurface agricultural drainage containing high levels of selenium from sensitive wildlife areas.
2. Obtain compliance with selenium water quality objectives in the San Joaquin River downstream of the Merced River confluence.
3. Obtain compliance with the selenium objectives in Mud Slough downstream of the San Luis Drain outfall and in the San Joaquin River from its confluence with Mud Slough to the confluence with the Merced River.

The first goal was achieved through the implementation of the GBP and is reinforced by a prohibition of discharge in the WDRs for the project. The second goal has been achieved through selenium load reduction measures implemented by the ~~GAF~~ Grasslands Area Farmers – Salt Slough and the stretch of the San Joaquin River downstream of the Merced ~~is~~ are no longer listed as impaired by selenium. The third goal has not yet been achieved. However, this Order and the Basin Plan requires that the third goal be met by 2019.

The Central Valley Water Board issued WDR 98-171 on 24 July 1998 for Phase I of the GBP. The WDRs established selenium discharge load values (pounds of selenium monthly and annually) that resulted in a 15 percent reduction from the average historical load to the San Joaquin River by the 5<sup>th</sup> year. Additional reductions in the selenium load were required to continue improvements to the San Joaquin River water quality and meet selenium requirements in the 1998 Basin Plan.

WDR 98-171 also required an annual update of the long-term Drainage Management Plan (LTDMP) that would include a summary of achievements of the water quality objectives in the Basin Plan and set in the WDR. Any plans and activities for long-term drainage management by the Grassland Area Farmers to meet the water quality objectives were discussed and goals were established. Any developments impacting the efforts of the Grassland Area Farmers were also discussed.

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<sup>2</sup> The Storm Event Plan was approved on 25 August 1997 by GAF and the Authority.

<sup>3</sup> The process for the storm event notifications was incorporated in the revised MRP approved on 7 September 2001.

<sup>4</sup> Agreement No. 6-07-20-21319

<sup>5</sup> A water year is defined as a 12 month time period from 1 October of one year to 30 September of the next. The water year is designated by the calendar year in which it ends (the year within which 9 of the 12 months fall).

Phase II

A ~~second~~<sup>6</sup> new Use Agreement between the Bureau and Authority was completed on 28 September 2001 following the completion of a Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR)<sup>7</sup>. Phase II covered a period from 1 October 2001 to 31 December 2009. During this period, the GBP was regulated by WDR Order 5-01-234 issued on 7 September 2001. The Monitoring and Reporting Program (MRP) attached to the Order required monitoring for general parameters<sup>8</sup>, selenium, boron, molybdenum, nitrates and aquatic toxicity testing at specific sites with set schedule and frequency. Stormwater monitoring was required during storm events when the GBP may not be able to accommodate all surface runoff, stormwater flows, and agricultural drainage water. The stormwater monitoring was required to determine the effect of GDA discharge diversion to Grassland and wetlands channels. The Order also included continued reporting of the LTDMP on an annual basis.

Selenium loads limits<sup>9</sup> were established for discharge to the San Joaquin River and waste discharge requirements were used to control discharges of subsurface agricultural drainage from the ~~GDA~~<sup>Grassland Drainage Area</sup>. The compliance timetable gave the Dischargers deadlines to meet the selenium objective in the San Joaquin River and various channels, including Salt Slough and Mud Slough (north).<sup>10</sup> There was also a prohibition of discharge effective 1 October 2010 for subsurface agricultural drainage discharges unless selenium water quality objectives were being met.

The GBP was in compliance with applicable objectives in most channels addressed in the Basin Plan, but was unable to fully manage all agricultural subsurface drainage to meet the water quality objective for Mud Slough (north) and the San Joaquin River above the Merced River confluence by the 1 October 2010 ~~deadline~~. The ~~Dischargers~~<sup>GBP operators</sup> believed that ~~at they e-project area~~ would achieve full control of agricultural subsurface drainage if additional time beyond the set compliance date was granted to allow time to obtain funding and develop technology to reduce selenium loads.<sup>11</sup>

Phase III

The ~~Record of Decision~~<sup>12</sup> to continue the GBP was based on an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) ~~that was for Phase III of the GBP was~~ finalized August 2009.<sup>13</sup> A ~~new~~<sup>third</sup> Use Agreement for the continued use of the San Luis Drain was signed for the period of 1 January 2010 through 31 December 2019.<sup>14</sup> The Central Valley Water Board passed amendments to the Basin Plan<sup>15</sup> to: 1) extend the date for meeting the selenium objective in Mud Slough (north) and the San Joaquin River above the Merced River to 31 December 2019; and 2) revised the

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**Comment [SCC-1072]:** The GAF had received \$25 million in state grants to construct treatment facilities, but the funds were not available due to the poor economy.

<sup>6</sup> Agreement No. 01-WC-20-2075

<sup>7</sup> URS, 2001. *Grassland Bypass Project Environmental Impact Statement and Environmental Impact Report*. Final May 25, 2001. Prepared for U.S. Bureau of Reclamation, Sacramento and Fresno, CA. and San Luis & Delta-Mendota Water Authority, Los Banos, CA.

<sup>8</sup> General parameters included flow, pH, electrical conductivity and temperature.

<sup>9</sup> Load limits for selenium were based on water year classification established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification (as defined in Footnote 17 for Table 3 in the State Water Resources Control Board's *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, May 1995) at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series. The previous year's classification will apply until an estimate is made of the current water year.

<sup>10</sup> Salt Slough and the wetland channels had a deadline of 10 January 1997 to meet 2 µg/L selenium, monthly mean; Mud Slough (north) and the San Joaquin River from Sack Dam to the Merced River had a 1 October 2010 deadline to meet 5 µg/L (4-day average); and the San Joaquin River below the Merced River (above normal and wet water years) a deadline of 1 October 2005 at 5 µg/L (4-day average), with critical, dry and below normal water years a deadline of 1 October 2010 at 5 µg/L (4-day average).

<sup>11</sup> Stated in ES2 Project Purpose and Need of the EIS/EIR for Phase III. See next section for more information.

<sup>12</sup> [Bureau of Reclamation, December 18, 2009, Record of Decision Grassland Bypass Project, 2010-2019](#)

<sup>13</sup> Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report*. Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA.

<sup>14</sup> Agreement No. 10-WC-20-3975, finalized 17 December 2009.

<sup>15</sup> Resolution No. R5-2010-0046, Amending the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Selenium in the Lower San Joaquin River Basin, 27 May 2010.

compliance time schedule located in chapter IV (implementation chapter) of the Basin Plan for Agricultural Drainage Discharges in the San Joaquin River Basin and its accompanying narrative description in Regional Board Prohibitions, section 6.c.

This Order implements the WDRs for Phase III of the GBP. New features in Phase III include in-valley ~~treatment drainage~~ reuse and treatment of drainage water at the San Joaquin River Quality Improvement Project (SJRIP) facility; utilizing and installing drainage recycling system to mix subsurface drain water with irrigation supplies under strict limits; continuing current land retirement policies; an active land management program to utilize subsurface drainage on salt-tolerant crops; and a no-tailwater policy to prevent silt from being discharged into the Drain. Discussion of these elements is in section V.

The Use Agreements and WDRs specified load reductions for selenium and salinity with values expressed in annual and monthly load objectives. It should be noted that the selenium load values were designed to meet the total maximum daily limit (TMDL) for the San Joaquin River by 2015.<sup>16</sup> The GDA is the major contributor for selenium in the San Joaquin River Basin.<sup>17</sup> The WDR selenium performance goal is 15 µg/L (monthly mean) by 31 December 2015 in Mud Slough (north) and the San Joaquin River from the Mud Slough (north) confluence to the Merced River. The selenium water quality objective for the same locations is 5 µg/L (4-day average) by 31 December 2019.

The Use Agreements between the Bureau and Authority also incorporated a performance incentive system in which GAF is assessed fees if selenium ~~and/or salinity~~ load reduction goals are not met. The fees are used for projects approved by the Oversight Committee. Fees are calculated by the Bureau of Reclamation for the attributable discharge for each year and month.

The 2009 Use Agreement provides “Incentive Fee Credits” when annual and monthly discharges are more than 10 percent below the respective load values specified in the tables for selenium and salinity. These incentive credits may be applied against future monthly or annual exceedances through December 2017. These “credits” apply to the Use Agreement between the Bureau and Authority, but are not part of this Order. Such credits could not be applied in a manner that would negate a violation of the limits in this Order.

The Use Agreements provided~~s~~ for project termination if annual selenium loads from the GBP exceed certain values. Figure 4 shows the annual selenium loads required by the water year type (critical, below normal, above normal and wet) with the corresponding values for termination of the project.<sup>18</sup> The graph shows a decrease in the annual selenium loads for each water year type until 2018 when the selenium loading ~~must~~will comply with the water quality objectives and TMDL requirements.

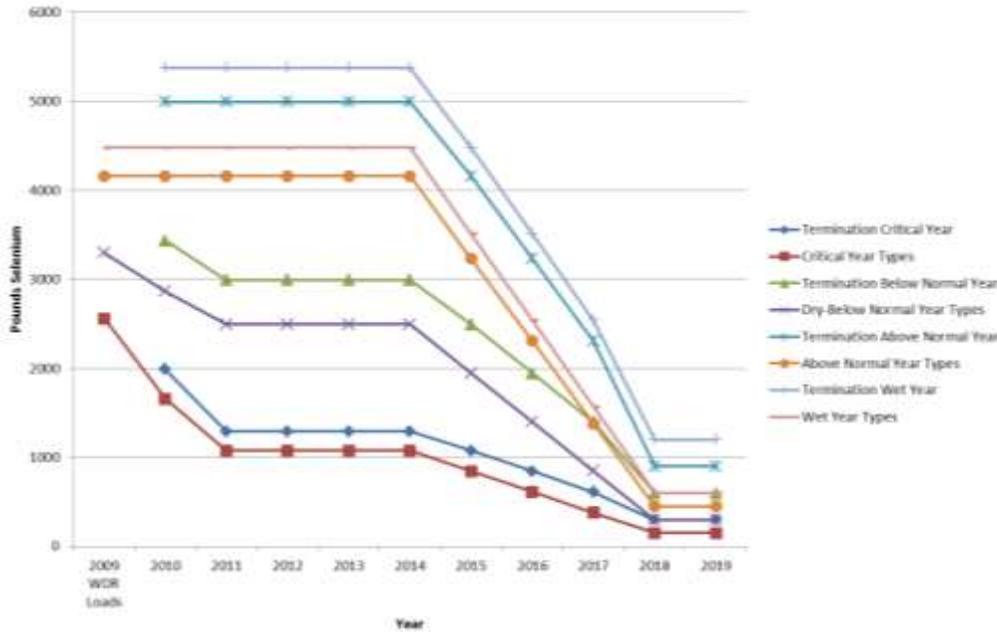
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<sup>16</sup> Selenium load limits have been met for the San Joaquin River below the confluence with the Merced River. The selenium objectives in Mud Slough (north) have not been met.

<sup>17</sup> Chilcott, J.E., 1988, *Water Quality of Tile Drainage Discharges in the San Joaquin River Basin*, Regional Water Quality Control Board, Central Valley Region, Staff Report. October, 1988.

<sup>18</sup> The Oversight Committee may overrule the termination if it finds, after consultation with other parties, the Authority has shown the exceedance was caused by unforeseeable and uncontrollable events.

**Figure 4: Annual Selenium Loads and Termination Loads by Water Year Type**



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**A. Project Management**

The Authority represents the collection of local drainage and water districts that operate the GBP. The Bureau and the Authority are the responsible parties for the GBP.

A number of participating organizations, besides the Bureau, Authority and Central Valley Water Board, are involved in the GBP data collection, monitoring, and reporting. These participants include:

- U.S. Environmental Protection Agency (USEPA)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Geological Survey (USGS)
- National Marine Fisheries Service (NMFS)
- California Department of Fish and Wildlife (CDFW)

To assist the Bureau and Authority, several committees and teams of private, State and Federal agencies are directly involved in aspects of the GBP by providing technical, advisory, and policy review and oversight. These include:

*Oversight Committee*

The Oversight Committee ~~was created in Phase II and~~ consists of representatives from the Bureau, USFWS, CDFW, USEPA and the Central Valley Water Board. The Oversight Committee role is to evaluate overall operations of the GBP, assess monetary charges to the Authority for selenium loads exceeding those specified in the Use Agreement, and to act on other issues brought to them by the Technical and Policy Review Team (TPRT) and/or the public.

*Technical and Policy Review Team (TPRT)*

The Technical Policy Review Team (TPRT) assists the Oversight Committee with technical issues. TPRT members include a representative the Bureau, the Central Valley Water Board, CDFW, NMFS, USFWS, and USEPA. A representative from the USGS serves as an independent technical advisor. Responsibilities of the TPRT include the review and analysis of analytical data and reports, and obtaining appropriate peer or scientific review as necessary.

*Data Collection and Reporting Team (DCRT)*

The Data Collection and Reporting Team (DCRT) members are agency representatives and contractors responsible for collecting, verifying, and reporting GBP data. The DCRT coordinates monitoring activities and addresses issues and concerns regarding data collection, data management, and quality assurance/quality control. The DCRT prepares annual reports that evaluate the effects of the GBP on water, sediment, and biota in the Grasslands watershed and lower San Joaquin River.

*Quality Control Officer*

A Bureau representative serves as the quality control officer, working with cooperating agencies to verify, validate, coordinate and update the quality control activities associated with the project.

**B. Surface Water Monitoring History**

Initial monitoring for the GBP started in 1995 and was performed by the Central Valley Water Board until 2011, when the Bureau assumed these duties. Monthly, quarterly, and annual reports are posted for all GBP monitoring on the San Francisco Estuary Institute (SFEI) website at <http://www.sfei.org/GBPProject/reports>.

While selenium is the primary concern, the drainage also contains boron, molybdenum, and high levels of salts and other constituents that can impact receiving waters. The Basin Plan contains numerical objectives for selenium, boron and molybdenum as well as narrative water quality objectives that apply to this water body. Table 1 shows the numerical objectives for selenium, boron and molybdenum for Mud Slough (north) and the San Joaquin River at various points.

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**Comment [SCC-1073]:** Reclamation will ask that the Regional Board handle overall QC/QA for the GBP

**Table 1: Selenium, Boron and Molybdenum Numerical Objectives**

| Constituent | Monthly-Mean Objective                             | Maximum                      | Location                                                                                        |
|-------------|----------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------|
| Selenium    | 5 µg/L (4-day average) 20 µg/L                     | 5 µg/L 4-day average 20 µg/L | Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River |
|             | 5 µg/L (4-day average) 12 µg/L                     | 12 µg/L 5 µg/L 4-day average | San Joaquin River, mouth of the Merced River to Vernalis                                        |
| Boron       | 0.8 mg/L monthly average (15 March-15 September)   | 2.0 mg/L                     | San Joaquin River, mouth of the Merced River to Vernalis                                        |
|             | 1.0 mg/L monthly average (16 September - 14 March) | 2.8 mg/L                     |                                                                                                 |
|             | 1.3 mg/L monthly average (Critical Year)           |                              |                                                                                                 |
| Molybdenum  | 19 µg/L monthly average                            | 50 µg/L                      | Salt Slough, Mud Slough (north) and San Joaquin River from Sack Dam to mouth of Merced River    |
|             | 10 µg/L monthly average                            | 15 µg/L                      | San Joaquin River, mouth of Merced River to Vernalis                                            |

**Comment [SCC-1074]:** What is the boron objective for Mud Slough?

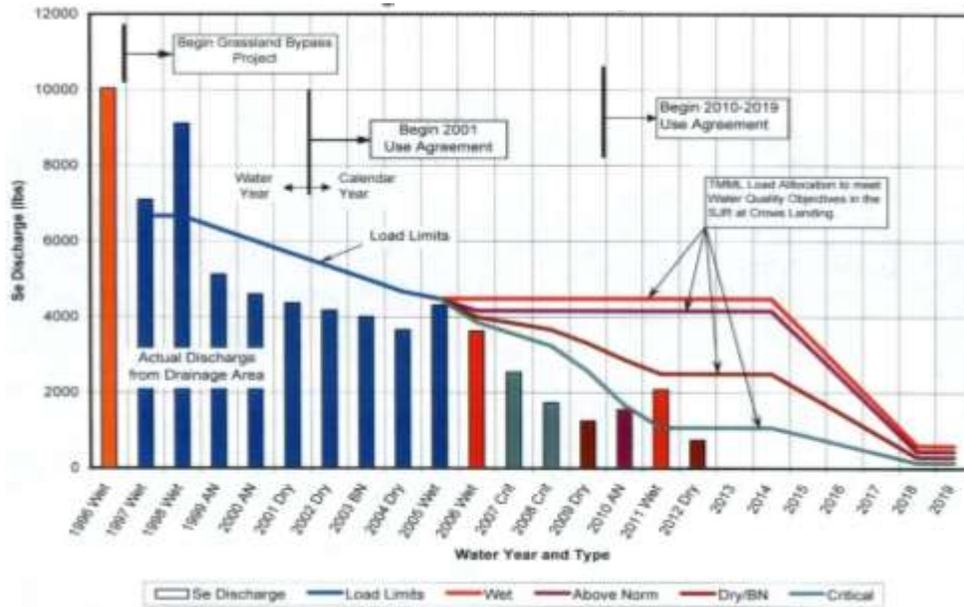
The lower San Joaquin River is 303(d) listed for salts. Effluent limits for salts are not in the waste discharge requirements for the GBP. The Basin Plan provisions for the *Control Program for Salt and*

*Boron Discharges into the Lower San Joaquin River*<sup>19</sup> requires that the Dischargers must by 30 June 2014: 1) participate in a Central Valley Water Board approved real-time management program; or 2) submit a management plan that includes the elements identified in the Monitoring and Reporting Program Appendix MRP-1 and is designed to meet the Base Salt Load Allocations identified in Table IV-4.4, *Summary of Allocations and Credits*,<sup>20</sup> within the applicable compliance schedule for compliance in Table IV-4.3.<sup>21</sup> A real-time monitoring program is being used to measure and report flow and electrical conductivity as part of the Use Agreement monitoring program. It is expected that the GBP data confirm that selenium reduction in waste discharges will also result in boron and salt reduction.

Previous monitoring sites targeted selenium concentrations from the GBP to determine compliance with selenium load limits set within the Use Agreements and the corresponding WDRs. Monthly load limits for selenium were also calculated based on the category of water year, historical monitoring data, the TMDL allocations, and required water quality objectives. Figure 5 shows the selenium discharged from the Grassland Drainage Area on an annual basis, with the limits set by the water year type.

**Figure 5: Grassland Drainage Area – Selenium Discharge and Targets**

From draft WY2010-WY2011 report (WY 2013 data has not been evaluated)



**D** Comment [SCC-1075]: We can provide 2013 data  
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**R** Comment [SCC-1076]: The selenium discharge in 2013 was 525 pounds  
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Historically, monitoring has consistently occurred at four areas with at least one monitoring location: 1) the San Luis Drain; 2) Mud Slough (north); 3) the wetlands channels; and 4) the San Joaquin River. The monitoring program has included sampling upstream and downstream sites (shown in Table 2) to determine selenium loading from the GBP and possible other contributors to the total selenium load. Selenium monitoring has historically occurred at Mud Slough (north) upstream of the Drain (Station C) to determine wetlands contribution; Mud Slough (north) downstream of the Drain (Station D) to determine total discharge from the GBP and wetlands to the San Joaquin River; and the GBP contribution to the selenium load by sampling in the Drain before discharge to Mud Slough (Station B). San Joaquin River

<sup>19</sup> Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, page IV-32.00  
<sup>20</sup> *Ibid.*, page IV-32.04  
<sup>21</sup> *Ibid.*, page IV-32.03

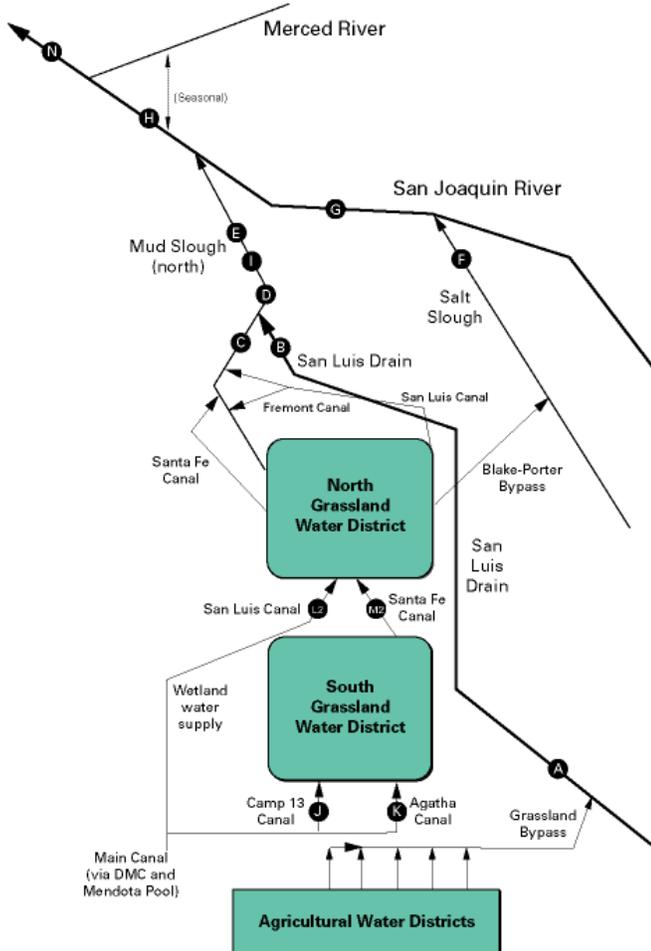
monitoring has occurred downstream of the Mud Slough discharge (Stations H and N) to determine the GBP's contribution to the river before and after confluence with the Merced River. Figure 6 is a schematic showing the location of these sites.

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**Table 2: Historic Monitoring Sites in Phases I and II of the Project**

| Feature            | Station | Description                                                                                          |
|--------------------|---------|------------------------------------------------------------------------------------------------------|
| San Luis Drain     | B       | San Luis Drain, upstream of discharge to Mud Slough (north)                                          |
| Mud Slough (north) | C       | Mud Slough (north) upstream of the San Luis Drain discharge.                                         |
|                    | D       | Mud Slough (north) downstream of the San Luis Drain discharge                                        |
| San Joaquin River  | H       | San Joaquin River before confluence with Merced River                                                |
|                    | N       | San Joaquin River at Crows Landing; downstream of confluence with Merced River, upstream of Vernalis |

**Figure 6: Schematic of Past Monitoring Sites**



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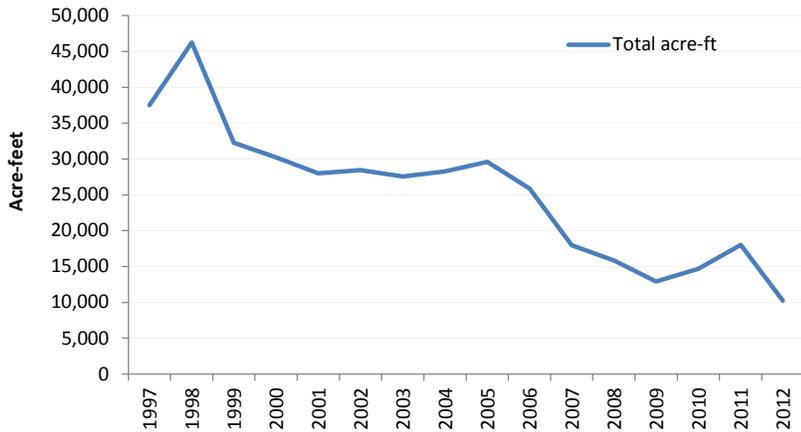
Additional monitoring sites included areas within the Drain (Station A), ~~in Salt Slough and other wetlands water supply channels~~ (Stations F, J, K, L2, M2), ~~in Mud Slough (north) (Stations E and F)~~, and the San Joaquin River ~~at Fremont Ford~~ (Station G). These sites are still being monitored, but on a less frequent schedule or during major storm events. Salt Slough monitoring was reduced since the Basin Plan selenium water quality objective<sup>22</sup> was met in Phase I and the channel has been delisted for selenium.

**C. Past Monitoring Results**

Past monitoring results are summarized in this section for the following parameters that are of concern: selenium, boron, molybdenum, salts (as indicated by electrical conductivity measurements), and aquatic toxicity. Figure 7 shows that the discharge from the ~~GDA Grassland Drainage Area~~ has decreased significantly<sup>23</sup> since GBP implementation. The decrease in flow is likely due to the combined result of water delivery infrastructure improvements, irrigation system modernization, and reuse activities for subsurface drainage.

**Figure 7: Total Flow from the Grassland Drainage Area, Years 1997 to 2012**

**Comment [SCC-1077]:** Flow from the GDA in 2013 was 7980 acre-feet



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**1. Selenium**

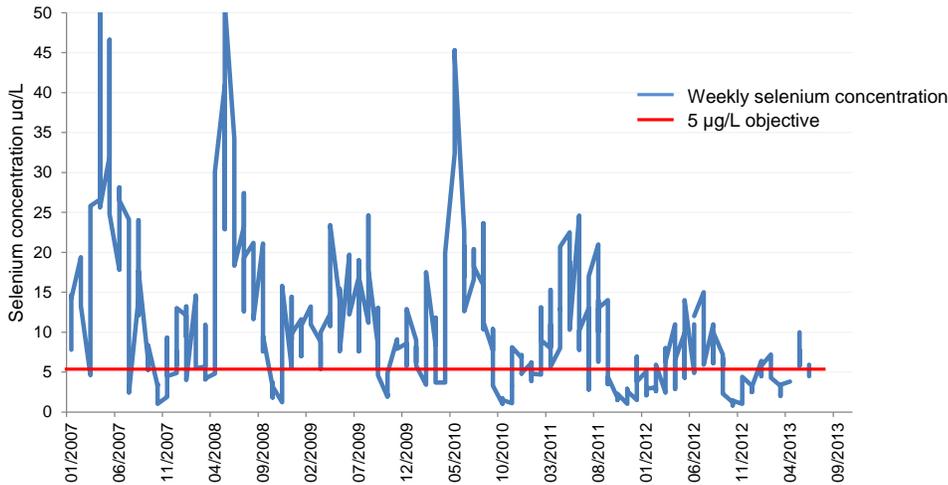
Figure 8 shows graphically the monthly average of selenium concentrations at Mud Slough (north) downstream of the Drain discharged from the GDA (Station D) from 2007 to 2013. The decrease in selenium concentration with the decrease in discharge volume from the GDA has decreased the selenium loading and moved the GAF along the “glidepath” identified in the Use Agreement. The selenium load has decreased approximately 80%<sup>24</sup> since the start of the program. Activities implemented to decrease the selenium loading include improved irrigation application, tiered water pricing, tailwater controls, seasonal land fallowing, and reuse and treatment involving recycling, and the use of subsurface drainage water on salt tolerant crops and to wet roadways for dust control.

<sup>22</sup> Water quality objective was 2 µg/L selenium (monthly mean) in Salt Slough and wetland water supply channels.

<sup>23</sup> Drainage is down 72% when comparing total flow from CY 2012 with CY1997.

<sup>24</sup> Percentage calculated based on average of selenium annual loads from 2008 to 2012 and the load in 1997. Values for 1997, 2008 to 2011 from Table 3c of Grassland Bypass Project Annual Report 2010-2011. 2012 selenium load value from letter dated 26 December 2013 from Joseph C. McGahan to Pamela C. Creedon, Waste Discharge Requirement Order No. t-01-234, Update of Long Term Drainage Management Plan.

**Figure 8: Selenium Concentration in Mud Slough below San Luis Drain 2007 to 2013**



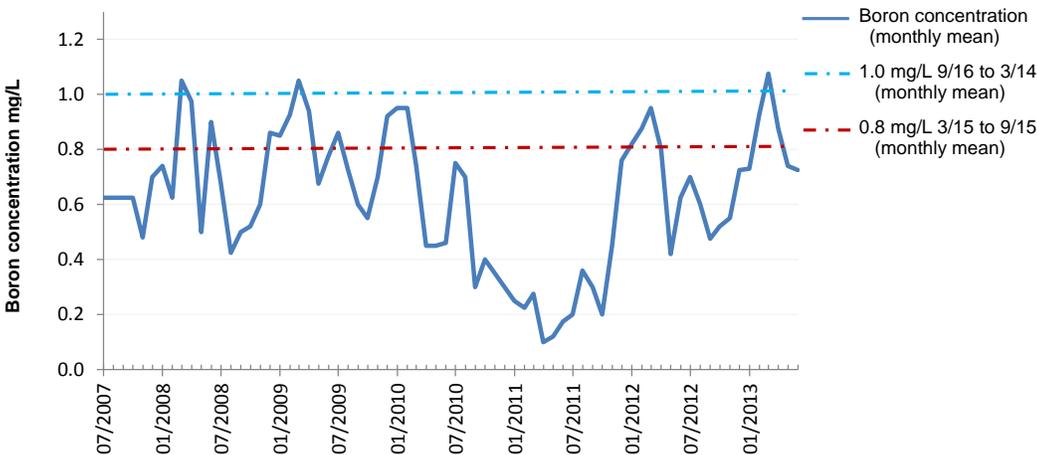
**Comment [SCC-1078]:** Selenium concentration in Salt Slough and the SJR below Merced should be shown as well. We can provide selenium concentration data for pre-project and all of the GBP.

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2. Boron and Molybdenum

Figure 9 shows graphically the monthly average of boron concentrations in the San Joaquin River after the confluence with the Merced River (Station N) from 2007 to 2013. The boron concentration generally meets the water quality objective and it is anticipated further implementation of the San Joaquin River Improvement Project will further reduce the boron concentrations from the GBP.

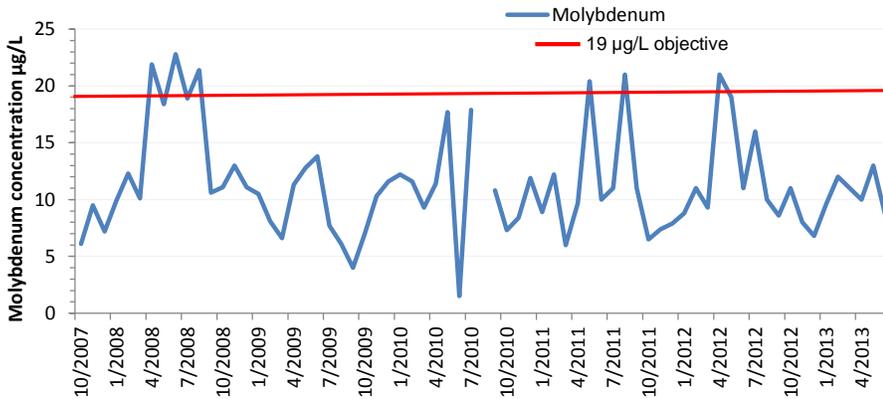
**Figure 9: Boron Concentration in San Joaquin River (Station N) 2007 to 2013**



**Comment [SCC-1079]:** Should have similar results for Mud Slough and Salt Slough

Figure 10 shows graphically the molybdenum concentrations observed in Mud Slough (Station D) from 2007 to 2013.<sup>25</sup> Molybdenum has been observed below the 50 µg/L maximum concentration.

**Figure 10: Molybdenum Concentration at Mud Slough below San Luis Drain**



**Comment [SCC-10710]:** Need to show similar results for Salt Slough and the lower SJR

3. Salts

~~Monthly and annual salt load values~~ are part of the ~~second and third~~ Use Agreements and are calculated using electrical conductivity and flow, ~~and are. Salt or salinity load limits are part of the Use Agreements and~~ based on water year category. Figure 11 shows the salt load limits based on the methodology in the 2001 Use Agreement with selenium loads as the driving management constraint.

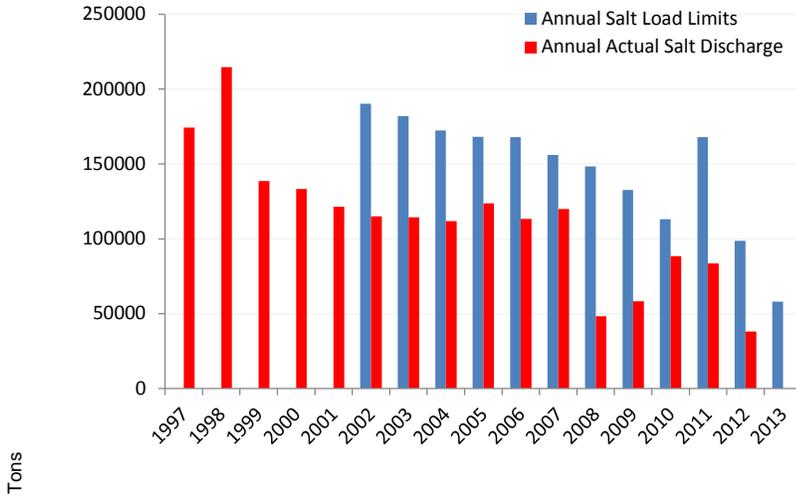
In addition, the Basin Plan has a control program for salt and boron discharges from the Lower San Joaquin River. Both the ~~U.S. Bureau of Reclamation~~ and the ~~San Luis & Delta-Mendota~~ Authority are participating in the Central Valley Water Board CV-SALTS program.

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**Figure 11: Annual Loads of Salt Discharged from the Grassland Drainage Area Compared to Salt Load Limits**

**Comment [SCC-10711]:** Suggest showing annual limit as a line; 2013 salt load discharge was 45,830 tons

<sup>25</sup> Water Year 2012 data ends in December 2011.



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**V. Implemented Actions and Management Practices**

The ultimate goal of the Grassland Bypass Project is to eliminate all agricultural subsurface drainage to the San Joaquin River, a zero discharge to the river. To accomplish this goal, the ~~GAF~~ Grassland Area Farmers (GAF) and the Dischargers have ~~worked to~~ implemented management practices and actions to lower the selenium load discharged to the San Joaquin River. This section lists some of the management practices and actions that have been implemented or are planned for implementation:

**A. Conservation Efforts**

Conservation efforts were initiated by GAF ~~and by the water district~~ to reduce the volume of subsurface drainage to the GBP. These efforts include the following:

1. Improved irrigation management  
 Growers have implemented management practices that limit pre-irrigation use and over-watering. Installation of drip or micro-irrigation, combined with improved water management, lowers water use and increases irrigation efficiency. Shorter water runs are encouraged. Improved irrigation efficiency results in less water going past the crop root zone and, thereby, raising the water table, which generates the subsurface drainage.  
 The member districts of the GDA have ~~or had~~ programs that encourage growers to improve their irrigation practices. Several of the districts have provided low interest loans to growers for improved irrigation equipment.
2. ~~Initiation~~ of tiered water pricing  
 The member districts of the GDA have implemented a tiered water price structure that encourages the conservation of water and efficient use of any delivered irrigation water. Higher prices per acre-foot of water delivered are charged if growers go above a certain amount.
3. Installation of tailwater controls  
 Growers are required to separate tailwater from subsurface drainage. Discharge of tailwater is prohibited from the GDA to the Grassland Bypass Channel. A number of GDA growers have installed tailwater return systems or use irrigation methods that do not generate surface runoff.
4. Reduced drainage seepage  
 Infrastructure improvements, such as lining canals and installing piping, have reduced drain seepage through the transport system. Reducing drainage seepage to groundwater helps keep groundwater levels lower, and, thereby, reduces the amount of subsurface drainage water produced.

### B. Reuse and recycling

The GAF and water districts have implemented the following efforts to reduce the subsurface drainage from entering waters of the state.

1. Recirculation of subsurface drainage by participating districts  
The participating water and irrigation districts in the GDA have constructed facilities to recirculate drain water back into their irrigation distribution system. Recycling drainage water reduces the amount of water that would otherwise need to be imported or pumped and reduces the net amount of subsurface drainage that needs to be discharged out of the area.
2. Prohibition of tailwater discharge into water district canals  
To encourage conservation and recycling, water districts do not allow the discharge of tailwaters into their canals within the GDA.
3. Use of subsurface drain waters on roads  
Subsurface drainage has been reused to wet roads for dust control.

### C. Voluntary fallowing of land

GDA growers were asked to voluntarily fallow land from agricultural use. In some cases, land impacted by shallow groundwater was permanently fallowed (*i.e., retired*) and the owners compensated. Approximately 10,400 acres in the GDA have been permanently fallowed, including lands served by the Broadview Water district and Widren Water District. These retired lands are no longer irrigated *with supplied water*, which reduces the impacts of deep percolation from these areas.

### D. San Joaquin River Improvement Project

The San Joaquin River Improvement Project (SJRIP) is a series of projects to aid the GAF with lowering the selenium loading from the GBP. Subsurface drainage from the *GDA surrounding area is channeled/displaced* to the SJRIP area. Projects in progress or being proposed include the following:

- Reuse of subsurface drainage water: Started in 2002, this project included the construction of distribution facilities and the planting of salt tolerant crops on agricultural land. The planted acreage has increased from the original 1,821 acres to more than 5,200 acres, which have been irrigated with drainage water or blended water (subsurface drainage and “fresh” irrigation water). In 2013, approximately 26,000 acre-feet of drain water was reused to irrigate *the crops that include producing* pistachio trees and salt-tolerant grasses.
- Future phases of the SJRIP project involve the development of additional acreage, installation of more subsurface drainage systems, and implementation of treatment and salt disposal components.
- Another SJRIP project involves a contaminant monitoring program for bird eggs. This biological monitoring started in 2002 and has examined the levels of selenium in a small sample of bird eggs each year. In line with this project, the GAF, *Bureau and Authority* have tried to discourage birds from inhabiting or nesting in the SJRIP. The program involves hazing birds during the nesting season, diligent water management, and modification of drains to discourage avian use.

#### Drainage Treatment Activities

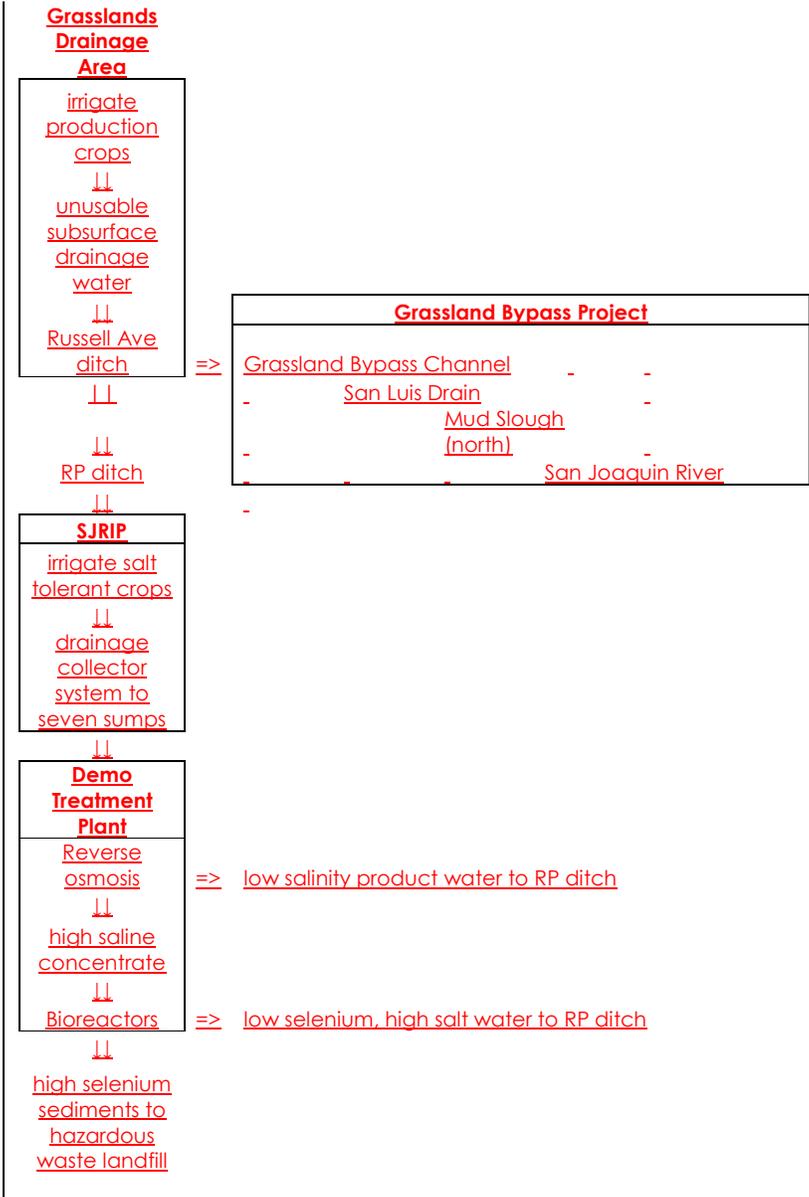
- Although not part of the SJRIP, but complementary to the GBP, the San Luis Demonstration Treatment Facility has been constructed by Reclamation. The facility is located on a portion of the SJRIP reuse area and will test various methods to reduce selenium and salinity in drainage water.
- The Demonstration Treatment Facility will run drainage water from the SJRIP area through various treatment processes to evaluate the efficacy for salt and selenium removal, and recycle the treated water back into the SJRIP drainage system (see Figure 12). The salt loading will not change with operation of the Demonstration Treatment Facility since both the treated effluent and

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the higher salinity byproduct will be being discharged back into the SJRIP. The selenium loading will be reduced since only the treated effluent will be discharged back into the SJRIP. Selenium will be removed with biological processes into solids that will be disposed of at a hazardous waste landfill.

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**Figure 12. Grasslands Drainage Management and Treatment**



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Panoche Drainage District is also implementing separate treatment projects:

- Water FX Solar Distillation Demonstration Project: use of a parabolic solar collector to heat and distill the subsurface drain water, then condensing the evaporate which should be “clean” water. A concentrated brine solution is produced as the other byproduct. Phase I of the project has been completed. The contractor proposes to introduce heat storage from the solar collectors to allow processing when dark or overcast.
- UCLA Smart Membrane Pilot Test: project will test an optical membrane monitoring device on a reverse osmosis pilot treatment system. Assembly of the system is in progress and testing has not yet begun.
- HDR Deep Well Injection Study: The project will review existing information on deep aquifer formations to estimate the potential for deep well injection of subsurface drainage as a management tool.

The different treatment options will be evaluated and assessed for efficiency and effectiveness in removing selenium and salts from the subsurface drainage waters. The ultimate goal is a “zero discharge” from the GDA by the end of 2019.

E.

**E. Demonstration Treatment Facility**

Although not part of the SJRIP, but complementary to the GBP, is the Panoche Drainage District Demonstration Treatment Facility. The facility is located on a portion of the SJRIP reuse area and will test various treatment projects to reduce selenium and salinity loads from the GAF. Projects being considered are:

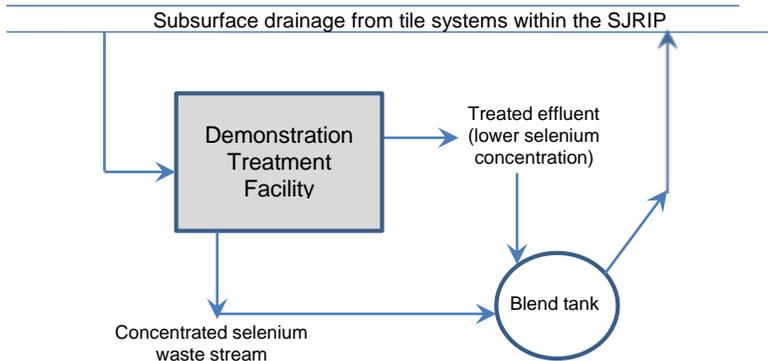
- Water FX Solar Distillation Demonstration Project: use of a parabolic solar collector to heat and distill the subsurface drain water, then condensing the evaporate which should be “clean” water. A concentrated brine solution is produced as the other byproduct. Phase I of the project has been completed. The contractor proposes to introduce heat storage from the solar collectors to allow processing when dark or overcast.
- UCLA Smart Membrane Pilot Test: project will test an optical membrane monitoring device on a reverse osmosis pilot treatment system. Assembly of the system is in progress and testing has not yet begun.
- HDR Deep Well Injection Study: The project will review existing information on deep aquifer formations to estimate the potential for deep well injection of subsurface drainage as a management tool.
- USBR RO Demonstration Project: The project will construct a demonstration-scale reverse osmosis treatment plant and a selenium removal component.

The Demonstration Treatment Facility is operated by the Bureau and the San Luis & Delta-Mendota Water Authority to intercept drainage from the existing subsurface agricultural drain systems in the SJRIP area, run the drainage water through various treatment processes to evaluate the efficacy for selenium removal, blend the output from each of the treatment systems, and then recycle the blended mixture back into the SJRIP drainage system (see schematic shown as Figure 12). The selenium loading will not change with operation of the Demonstration Treatment Facility since both the treated effluent and the higher selenium byproduct will be blended prior to being discharged back into the SJRIP subsurface drainage system.

**Figure 12: Schematic of Demonstration Treatment Facility**

The different treatment options will be evaluated and assessed for efficiency and effectiveness in removing selenium and salts from the subsurface drainage waters. The ultimate goal of the GAF is a “zero discharge” from the GDA by the end of 2019.

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#### F. Removal of sediment from the San Luis Drain

Reclamation and the Authority have been monitoring the accumulation and selenium content of sediment in the Drain. Recent data<sup>26</sup> indicate that 214,000 tons of sediment have accumulated in the Drain during the GBP, and the selenium concentration in sediment in 2012 was 4 – 23 mg/kg.

Selenium is listed as a hazardous waste at high concentrations under the USEPA 40 CFR 261.24.<sup>27</sup> Sediments in the San Luis Drain (SLD) ~~may~~ contain selenium. These sediments, if transported along the Drain, would transport the selenium that may then migrate back into the water column. If selenium migration from the sediment to water column occurs, this selenium would be included in the total annual load discharged by the GAF. If sediment acts as a sink (or repository) for the selenium, then the selenium concentration may reach the value where it may be considered “hazardous” waste.

The ~~2009~~ Use Agreement limits the maximum rate of flow in the Drain to be 150 cfs in order to avoid re-suspending sediment that may contain selenium. If monitoring results indicate the Drain behaves like a sink, the total selenium load in the sediment can be calculated and the information used to determine if the concentrations are close to hazardous waste values. Sediments would be removed before composite concentrations reach those values.

#### VI. Monitoring in Phase III

The Basin Plan amendments allow discharges from the GBP area to continue to exceed selenium objectives at Mud Slough (north) and the San Joaquin River between the Mud Slough discharge and the confluence with the Merced River. Load limits for selenium set forth in this Order and the required monitoring will determine if progress is being made to reach compliance with water quality objectives.

Table 3 shows the compliance time schedule for meeting the selenium water quality objective and performance goal as specified in the Basin Plan.

<sup>26</sup> [San Francisco Estuary Institute, Grassland Bypass Project Annual Report 2012 – 2013. Draft Chapters 9 and 10 posted on SFEI Website.](#)

<sup>27</sup> USEPA defines materials with a selenium concentration of 1 ppm (or mg/kg), if no longer useful and “discarded”, to be “hazardous waste” and must be disposed in accordance with regulations.

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**Table 3: Selenium Compliance Time Schedule**

(The performance goal is in italics; the water quality objective is in bold.)

| Water Body                                                                                      | 31 December 2015                | 31 December 2019                |
|-------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Mud Slough (north) and the San Joaquin River from the Mud Slough Confluence to the Merced River | <i>15 µg/L<br/>monthly mean</i> | <b>5 µg/L<br/>4-day average</b> |

Total maximum monthly loads (TMMLs) for selenium have been established based on the water quality objective which will apply no later than 31 December 2019 (Table 4.)

**Table 4: Selenium Monthly Load Allocations for the Grassland Drainage Area<sup>28</sup>**  
 (pounds of selenium)

| Month     | Effluent Limits which apply no later than 31 December 2019 |                  |              |      |
|-----------|------------------------------------------------------------|------------------|--------------|------|
|           | Critical                                                   | Dry/Below Normal | Above Normal | Wet  |
| October   | 55                                                         | 233              | 260          | 328  |
| November  | 55                                                         | 233              | 260          | 328  |
| December  | 152                                                        | 319              | 398          | 211  |
| January   | 151                                                        | 319              | 398          | 211  |
| February  | 93                                                         | 185              | 472          | 488  |
| March     | 92                                                         | 184              | 472          | 488  |
| April     | 101                                                        | 193              | 490          | 506  |
| May       | 105                                                        | 197              | 497          | 512  |
| June      | 69                                                         | 130              | 212          | 354  |
| July      | 70                                                         | 131              | 214          | 356  |
| August    | 75                                                         | 137              | 225          | 366  |
| September | 57                                                         | 235              | 264          | 332  |
| Total     | 1075                                                       | 2496             | 4162         | 4480 |

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Past monitoring has shown boron and salt loads have decreased as selenium loads have decreased. It is expected that this correlation will continue.

**A. Monitoring in Phase III**

The monitoring sites and parameters analyzed in this MRP Order are used to evaluate compliance with the objectives and limitations in the Basin Plan. Additional monitoring at other locations and for other constituents are specified in the [Use Agreement/GBP Monitoring Plan](#), but are not required by this MRP Order.

GBP's Phase III monitoring sites relevant to this Order are shown in Table 5. Monitoring sites from the previous MRP Order were changed due to safety concerns, operational changes, and monitoring costs. Monitoring at Salt Slough was dropped since the selenium water quality objective was met. These changes include: 1) continuous monitoring of flow, electrical conductivity and temperature at certain stations due to installation of transmitting pressure transducers; 2) replacement of Station H2 with Station

<sup>28</sup> The effluent limits in Table 4 are based on the calculated load allocation need to meet the water quality objectives the San Joaquin River at Crows Landing. The monthly load allocation is based on the water year classification applied to the following calendar year. For example, the October through December 2014 load limits are based on the water year classification for October 2013 through September 2014.

R as a monitoring site in the San Joaquin River; 3) replacement of Station B2 with Station B3 in the San Luis Drain; and 4) removing monitoring from the wetland channels except during storm events. A map of these sites is shown in Figure 13.

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**Table 5: Phase III Monitoring Stations**

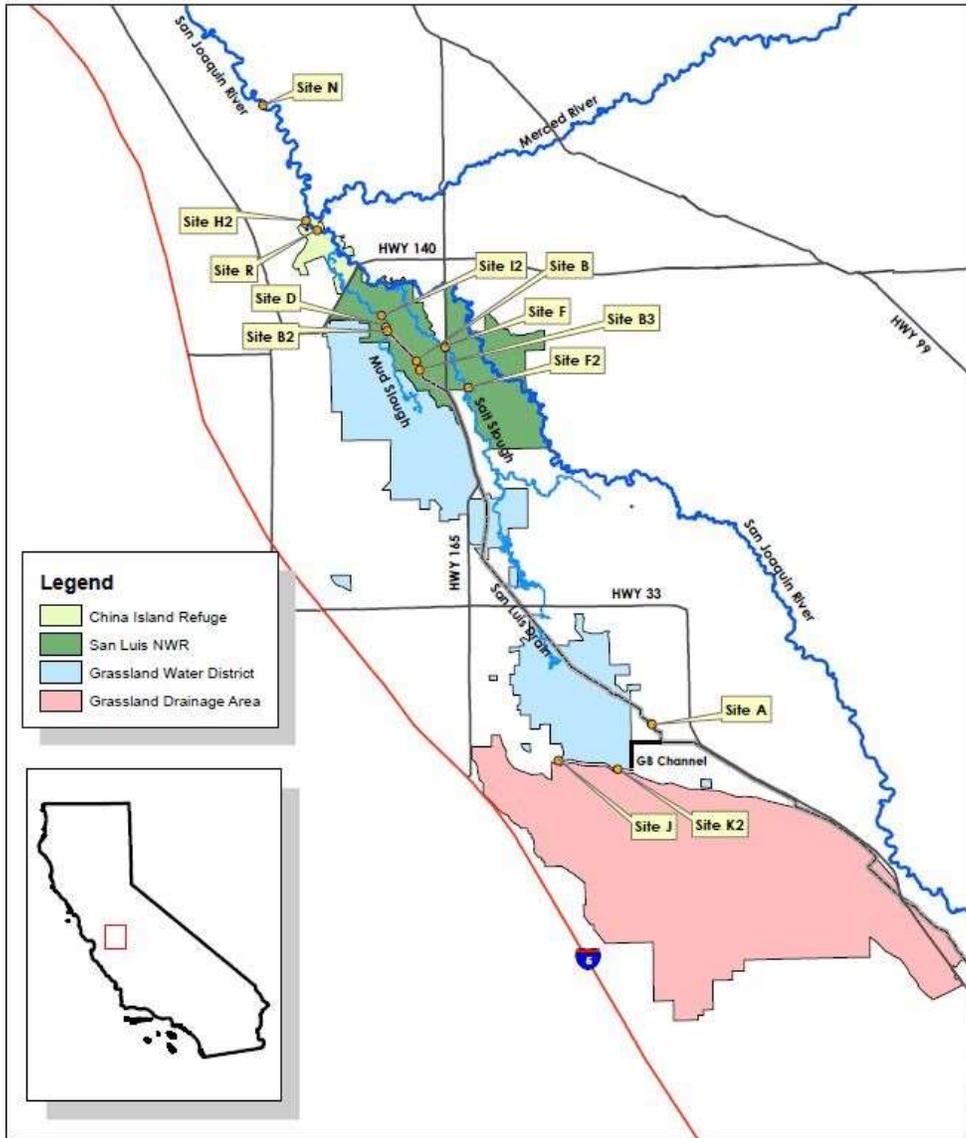
| Feature                   | Station | Location                       | Latitude   | Longitude    |
|---------------------------|---------|--------------------------------|------------|--------------|
| <b>San Luis Drain</b>     | B2**    | Terminus at Mud Slough         | 37.26100 N | -120.90520 W |
|                           | B3      | Gun Club Road                  | 37.23159 N | -120.87599 W |
| <b>Mud Slough (north)</b> | D       | Downstream of SLD discharge    | 37.26374 N | -120.90627 W |
| <b>Wetlands channels</b>  | J*      | Camp 13 Drain, headworks       | 36.94117 N | -120.75685 W |
|                           | K*      | Agatha Canal, headworks        | 36.93399 N | -120.70258 W |
| <b>San Joaquin River</b>  | R       | China Island Unit              | 37.33622 N | -120.96763 W |
|                           | H2**    | Hills Ferry above Merced River | 27.34737 N | -120.97500 W |
|                           | N       | Crows Landing                  | 37.43149 N | -121.01341 W |

\* Samples will be collected when water is passing site during a storm event.

\*\* Flow monitoring at station only; no monitoring required by MRP.

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Figure 1243: Monitoring Stations for Phase III



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Figure is from *Grassland Bypass Project 2013 Revised Monitoring Program*, 26 March 2013

### B. Surface Water Monitoring Requirements in Phase III<sup>29</sup>

Table 2 of the MRP Order summarizes the monitoring stations, parameters and frequency for sampling required by the WDR during Phase III. At Stations B2 and H2 only flow will be monitored.

Monitoring will be performed by the ~~Reclamation and the Authority entities with responsibilities and authority in the Grassland Drainage Area~~ as specified in WDR Order R5-2014-XXXX. The Dischargers are required to submit an Annual Monitoring Report by 31 March of each year that will cover the monitoring period from the previous calendar year (1 January through 31 December). The following parameters will be monitored.

#### 1. Flow

Flow is a basic parameter in the measurement of contaminant loads in the Grassland Basin. Flow in the San Luis Drain must be managed to prevent sediment erosion. For all sites, flow measurements are daily averaged based on continuous measurements, or the flow observed passing over weir boards or across a staff gauge.

#### 2. Selenium

The monitoring program for Phase III requires weekly monitoring of selenium (total) at Stations B3, D, R, and N. Additional sampling will occur in the wetlands channels and Mud Slough (north) if flow is passing through during a storm event.

#### 3. Boron and Molybdenum

Boron is to be measured on a weekly basis at Stations D, R, and N to determine compliance with the numeric objectives in the Basin Plan for the San Joaquin River. Sampling at Stations D and R will be used to determine if discharge from Mud Slough (north) after the confluence with the San Luis Drain or other sources in the San Joaquin River may be contributing to any boron exceedances further downstream

Molybdenum is sampled monthly at Stations B3, D, R, and N to determine compliance with numeric objectives in the Basin Plan for Mud Slough (north), San Joaquin River downstream of the confluence with the Merced River, and the San Joaquin River after the Merced River confluence. Monitoring at Station B3 will determine the contribution from the GDA to Mud Slough (north).

#### 4. Salts

Electrical conductivity, taken on a daily average, can be used as an indicator of salts. Continuous real-time monitoring for electrical conductivity and flow are taken at Stations D, H2 and N. Flow measurements are measured by pressure transducers at these sites. Weekly sampling at Stations B3 and R will be required by the MRP and will include electrical conductivity as part of the field measurements.

#### 5. Nutrients

Nutrients monitoring include nitrates as Nitrogen (N) and total ammonia as N. Previous monitoring data from 2000 to 2013 at Station D indicate total phosphorus as P is less than 0.5 mg/L. Nitrate as N during that same period showed 21 events (weekly sampling) with concentrations above the 10 mg/L level, but only 1 event since 2008. Monitoring occurs monthly at Stations B3 and D.

#### 6. Pesticides

Pesticides will be monitored biannually with the pesticides analyzed based on evaluation by the ~~Discharger and the~~ Regional Board of pesticide use data for the GDA. Sampling timing will be dependent on use periods and will occur at Stations B3, D and R. The entire Central Valley currently has Total Maximum Daily Loads (TMDLs) for diazinon, chlorpyrifos, and organochlorine pesticides, and Regional Board staff is developing a general pesticide TMDL for the Central Valley.

#### 7. Aquatic Toxicity

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<sup>29</sup> DCRT. Grassland Bypass Project 2013 Revised Monitoring Program dated 26 March 2013.

Aquatic toxicity monitoring is used to evaluate compliance with the Basin Plan narrative toxicity water quality objective. The toxicity monitoring is monthly for ~~all species.~~ ~~S~~samples are to be collected from Station D. Toxicity testing will involve three species: *Magna dubia*, *Pimpehales promelas*, and *Selenastrum capricornutum*. Acute toxicity testing (4-day test) will be used for *M. dubia* and *P. promelas*, with results reported on survival compared to a lab control.<sup>30</sup> Chronic toxicity testing (7-day) shall be performed with *S. capricornutum* with the results reported based on growth compared to the lab control.<sup>31</sup>

#### 8. Sediment Toxicity

Sediment toxicity is used to evaluate compliance with the Basin Plan narrative toxicity water quality objective and narrative settleable material objective. The sediment toxicity test is a 10-day test with *Hyalella azteca* with reporting based on survival compared to a lab control.<sup>32</sup> Sediment testing for total organic carbon and grain size will be concurrent with the *H. azteca* toxicity testing since these factors have been found to influence sediment toxicity results.

#### 9. Sediment Monitoring

Sediment testing is required annually for Station B3 with the analyses to be determined.

Comment [SCC-10712]: Frequency?

Additional testing by the Dischargers, not required by the MRP, will occur at various locations in the San Luis Drain for sediment depth and cross-sectional area, selenium, total organic carbon and percent moisture. These values will be used to determine the sediment volume in the drain, and changes in quantity and movement of sediment in the Drain. The chemical analyses will be used as a comparison with Department of Health Services and USFWS selenium criteria for hazardous waste and ecological risk, respectively.

#### C. Stormwater Monitoring

Storm and flood event monitoring will be required when flows are expected to exceed the capacity of the San Luis Drain as a result of major rainfall events, and discharges must be made from the GDA to Grasslands wetlands water supply channels. Actions to be taken are specified in the MRP and Storm Event Plan.<sup>33</sup>

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#### VII. Technical Reports

The surface water quality monitoring under the Order is regional in nature, since the GBP addresses drainage discharges at a regional level and responsibility for those discharges is assumed by entities with responsibility and authority in the Grassland Drainage Area. A benefit of regional monitoring is the ability to determine whether water bodies accepting discharges from the ~~GD~~Grassland Drainage Area are meeting discharge and receiving water limitations. Regional monitoring allows the Central Valley Water Board to determine, at the regional level, whether implemented operations and actions are protective of water quality. There are limitations to regional monitoring when trying to determine possible sources of water quality problems.

Therefore, through the Surface Water Quality Management Plans, the Dischargers must evaluate the effectiveness of its operations in meeting discharge and receiving water limitations. Through the evaluations and studies conducted by the Dischargers, and the board's compliance and enforcement activities, the board will be able to determine whether is the Dischargers are complying with the Order.

<sup>30</sup> USEPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. USEPA-821-R-02-012. Test methods 20021.0 and 2000.0 for *D. magna* and *P. promelas*, respectively.

<sup>31</sup> USEPA, 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organism, Fourth Edition. USEPA-821-R-02-013. Test method 1003.0.

<sup>32</sup> USEPA, 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. Test method 100.1.

<sup>33</sup> Grassland Area Farmers and San Luis & Delta-Mendota Water Authority. "A Storm Event Plan for Operating the Grassland Bypass Project". August 25, 1997.

This Order requires the Dischargers to provide technical reports. These reports may include special studies at the direction of the Executive Officer. The Executive Officer may require special studies where the required monitoring is ineffective in determining potential sources of water quality problems. Special studies help ensure that the potential information gaps may be filled through targeted technical reports.

### VIII. Reports and Plans

Central Valley Water Board staff will post all plans and reports required for approval by the Executive Officer on the board's website upon approval.

### IX. Water Quality Objectives

Surface water limitations in section II of the Order specify that waste discharge may not cause or contribute to an exceedance of discharge or receiving water limitations, or cause a trend in degradation that may threaten applicable beneficial uses, or cause a condition of pollution or nuisance.

Water quality objectives that apply to surface water are described in the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan). Applicable water quality objectives include, but are not limited to, (1) the numeric objectives, including the bacteria objective, the chemical constituents objective (includes listed chemicals and state drinking water standards, i.e., maximum contaminant levels (MCLs) promulgated in Title 22 California Code of Regulations (CCR) Division 4, Chapter 15 sections 64431, 64444 and 6449 that are applicable through the Basin Plan to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, the salinity objectives, and the turbidity objectives; and (2) the narrative objectives, including the biostimulatory substances objective, the chemical constituents objective, and the toxicity objective. The Basin Plan also contains numeric water quality objectives that apply to specifically identified water bodies, such as the areas in the Grassland Bypass Project. The Basin Plan includes performance goals and discharge and receiving water limitations for the Grassland area. Federal water quality criteria that apply to surface water are contained in federal regulations referred to as the California Toxics Rule and the National Toxics Rule. See 40 CFR sections 131.36 and 131.38.

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The requirements that waste discharge not unreasonably affect beneficial uses or cause a condition of pollution or nuisance are prescribed pursuant to sections 13263 and 13241 of the California Water Code. Section 13263 of the California Water Code requires Regional Water Boards, when establishing waste discharge requirements, to consider the need to prevent nuisance and the provisions in section 13241 of the California Water Code. Section 13241 requires Regional Water Boards to consider several factors when establishing water quality objectives including prevention of nuisance and reasonable protection of beneficial uses.

#### A. Implementation of Water Quality Objectives

The Basin Plan includes numeric and narrative water quality objectives. The narrative toxicity objective states: *"All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."* The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituent objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, *"...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)"* in Title 22 of the California Code of Regulations (CCR). The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs. The narrative tastes and odors objective states: *"Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses."*

The Sacramento-San Joaquin Basin Plan at page IV-16.00, contains an implementation policy, "Policy for Application of Water Quality Objectives," that specifies that the Central Valley Water Board "will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives." With respect to narrative objectives, the Regional Water Board must establish limitations using one or more of three specified sources, including: (1) USEPA's published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the Regional Water Board's "Policy for Application of Water Quality Objectives"), or (3) an indicator parameter. For purposes of this Order, all three sources will be used as part of the process described below.

Implementation of numeric and narrative water quality objectives under the Order involves an iterative process. The Order's MRP establishes management plan trigger limits that are equivalent to the applicable Basin Plan numeric water quality objectives. For constituents that are not assigned Basin Plan numeric water quality objectives, Central Valley Water Board staff will develop trigger limits in consultation with the Department of Pesticide Regulation (for pesticides) and other agencies as appropriate. Central Valley Water Board staff will provide interested parties, including the Dischargers, with an opportunity to review and comment on the trigger limits. The Executive Officer will then provide the trigger limits to the Dischargers. Those trigger limits will be considered the numeric interpretation of the applicable narrative objectives. In locations where trigger limits are exceeded, water quality management plans must be developed that will form the basis for reporting which steps have been taken to achieve compliance with numeric and narrative water quality objectives.

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#### **X. Non-Point Source (NPS) Program**

This Order regulates waste discharges from irrigated agricultural lands to state waters as an NPS program. Accordingly, the waste discharge requirements must implement the provisions of the State Water Board's *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy). Under the NPS Policy, the Regional Water Board must find that the program will promote attainment of water quality objectives. The nonpoint-source program also must meet the requirements of five key structural elements. These elements include (1) the purpose of the program must be stated and the program must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements; (2) describe the practices to be implemented and processes to be used to select and verify proper implementation of practices; (3) where it is necessary to allow time to achieve water quality requirements, include a specific time schedule, and corresponding quantifiable milestones designed to measure progress toward reaching specified requirements; (4) feedback mechanisms to determine whether the program is achieving its purpose; and (5) the consequences of failure to achieve the stated purpose.

This Order addresses each of the five key elements, as described below.

- (1) The purpose of this Order is to address the water quality impacts of surface water discharges from the area served by the GBP. The principal goal of the GBP is summarized as providing for the achievement of the water objectives set by the board and the Basin Plan related to subsurface drainage discharges from the Grassland Drainage Area while maintaining viable agricultural production in the area. The requirements of this Order include requirements to meet discharge and receiving water limitations, applicable water quality objectives as stated in the Basin Plan and the requirements of State Water Board Resolution 68-16 (antidegradation requirements). Further discussion of this Order's implementation of antidegradation requirements is given below under the section titled "State Water Board Resolution 68-16."
- (2) The board is prevented by Water Code section 13360 from prescribing specific management practices or measures to be implemented. However, it may set forth performance standards and require dischargers to report on what measures they have or will implement to meet those standards. This Order requires that the Dischargers report in the Drainage Management Plan updates on the actions that have or will be implemented to achieve compliance with discharge and

receiving water limitations. The update will include the description of various control or management practices utilized to control the discharge of selenium and other constituents of concern and the milestones achieved set in the Basin Plan or previous annual reports under the Drainage Management Plan. The Drainage Management Plan may be submitted as part of the Annual Monitoring Report.

- (3) This Order requires the development and implementation of a management plan to meet water quality objectives stated in the Basin Plan. A time schedule for compliance with the Basin Plan objectives is part of this Order. In addition, this Order requires the development of SQMPs when water quality objectives are not met. For constituents that do not have a specific time schedule in the Basin Plan, SQMPs must include time schedules for implementing the plans and meeting the receiving water limitations (section II of the Order) as soon as practicable, but within a maximum of 10 years. The time schedules for the SQMPs must be consistent with the requirements for time schedules set forth in this Order. The time schedules must include quantifiable milestones that will be reviewed by the Executive Officer and the public prior to approval. The time schedule requirements in this Order are consistent with Key Element 3.
- (4) To provide feedback on whether program goals are being achieved, this Order requires surface water quality monitoring. This feedback will allow iterative implementation of practices to ensure that program goals are achieved. This feedback mechanisms required by this Order are consistent with Key Element 4.
- (5) This Order establishes the following consequences where requirements are not met:
  - (a) The Dischargers will be required, in an iterative process, to conduct additional monitoring and/or implement actions/measures when discharge or receiving water limitations or water quality objectives are not being met;
  - (b) Appropriate Central Valley Water Board enforcement action where the iterative process is unsuccessful, program requirements are not met, or time schedules are not met;

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This Order describes consequences for failure to meet requirements and is consistent with Key Element 5.

#### **XI. California Environmental Quality Act (CEQA)**

This Order is covered by the Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project (EIS/EIR).<sup>34</sup> The lead agency for the EIS was the U.S. Bureau of Reclamation. The lead agency pursuant to CEQA (Public Resources Code section 21100 et seq.) was the San Luis & Delta-Mendota Water Authority. A Notice of Determination (NOD) was filed on 12 October 2009.<sup>35</sup> A Record of Decision (ROD-07-141) was issued in December 2009. No legal challenges were made to either decisions.

This Order relies on the environmental impact analysis contained in the EIS/EIR to satisfy the requirements of CEQA. The EIS/EIR identifies the following mitigation measures that apply to surface water discharges regulated by this Order:

- Update and implement a water quality monitoring program. Results of the monitoring program for the GBP will be reviewed semi-annually, or more frequently as required, by the Oversight Committee. If unacceptable problems or impacts re identified, appropriate mitigative actions will be identified by the Oversight Committee to address the problems.

<sup>34</sup> Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report*. Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA

<sup>35</sup> NOD filed for the Grassland Bypass Project, 2010-2019, State Clearinghouse Number 2007121110.

Appropriate mitigative actions may include, but not necessarily be limited to, interruption of specific identified contaminant pathways through hazing or habitat manipulation; increased management, enhancement, and recovery activities directed at impacted species in channels cleaned up as a result of the GBP, and/or establishment and attainment of more stringent contaminant load reductions. The costs of mitigation, as well as any required cleanup, will be borne by the draining parties. Monitoring to ensure the mitigative actions are effective will be required or continued to evaluate effectiveness.

- Implement the Storm Event Plan developed in 2007 when trigger event occurs. When major storm events occur, the Grassland Bypass Channel may not be able to handle the combined commingled discharge of surface runoff, storm water flows and agricultural drainage Flow may be diverted to Grassland Water District channels. Increased water velocities in the Drain have the potential to scour and damage the structural integrity of the Drain, as well as releasing the accumulated sediment in the channel. The Storm Event Plan details a process for notifying regulatory and system users, the trigger velocity when gates to the Grassland Water District supply channel may be opened and then closed, and a requirement for daily monitoring to determine quantity and quality of the bypassed flows.

The board Order requires implementation of these mitigation measures.

## **XII. Statement of Policy With Respect to Maintaining High Quality Waters in California (State Water Board Resolution 68-16)**

This section of the Information Sheet first provides background on State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16). Following the background discussion, the Information Sheet describes how the various provisions in the WDR and MRP collectively implement Resolution 68-16. In summary, the requirements of Resolution 68-16 are met through a combination of upfront project-level planning and implementation; monitoring and assessments to determine trends; and regional planning and revisions to project implementation when trends in degradation are identified. This project has been in operation since 1996 and it has been regulated by WDRs since 1998. Monitoring has demonstrated that there have been significant reductions in the discharge of selenium and salt.

Regional trend monitoring of surface water together with periodic assessments of available surface water information is required to determine compliance with water quality objectives and determine whether any trends in water quality improvement or degradation are occurring. If trends in such degradation are identified that could result in impacts to beneficial uses, a surface quality management plan must be prepared by the Dischargers. The plan must include the identification of steps that will be implemented to address the trend in degradation and an evaluation of the effectiveness of those practices in addressing the degradation. Failure to implement improved practices will result in further direct regulation by the board, including, but not limited to, taking enforcement action.

A separate Board order will be developed for regulation of discharges to groundwater from the area served by the GBP. As discussed further below, the combination of these requirements fulfill the requirements of Resolution 68-16 for any degradation of high quality waters authorized by this Order.

### **A. Background**

Basin Plan water quality objectives are developed to ensure that beneficial uses are protected. The quality of some state surface waters is higher than established Basin Plan water quality objectives. For example, nutrient levels in good, or "high quality" waters may be very low, or not detectable, while existing water quality standards for nutrients may be much higher. In such waters, some degradation of water quality may occur without compromising protection of beneficial uses. State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16) was adopted in October of 1968 to address high quality waters in the state. Title 40 of the Code of Federal Regulations, Section 131.12 -- Antidegradation Policy (40 CFR 131.12) was

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developed in 1975 to ensure water quality necessary to protect existing uses in waters of the United States. Resolution 68-16 applies to discharges to all high quality waters of the state (Water Code section 13050[e]); 40 CFR 131.12 applies only to surface waters.

The requirement to implement the Antidegradation Policy is contained in Resolution 68-16 (provision 2 presented below) and in the Basin Plan. The Basin Plan states that the Central Valley Water Board actions must conform to State Water Board plans and policies and among these policies is Resolution 68-16, which requires that:

1. "Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies."
2. "Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

For discharges to surface waters only, the Federal Antidegradation Policy (Section 131.12, Title 40, CFR) requires:

1. "Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
2. Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.
3. When high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.
4. In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act."

The State Water Board has interpreted Resolution 68-16 to incorporate the Federal Antidegradation Policy in situations where the policy is applicable. (SWRCB Order WQ 86-17). The application of the Federal Antidegradation Policy to nonpoint source discharges (including discharges from irrigated agriculture) is limited.<sup>36</sup>

<sup>36</sup> 40 CFR 131.12(a)(2) requires that the "State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and *all cost-effective and reasonable best management practices for nonpoint source control*." The EPA Handbook, Chapter 4, clarifies this as follows: "Section 131.12(a)(2) does not mandate that States establish controls on nonpoint sources. The Act leaves it to the States to determine what, if any, controls on

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Administrative Procedures Update (APU) 90-004, Antidegradation Policy Implementation for NPDES Permitting, provides guidance for the Regional Water Boards in implementing Resolution 68-16 and 40 CFR 131.12, as these provisions apply to NPDES permitting. APU 90-004 is not applicable in the context of this Order because nonpoint discharges from agriculture are exempt from NPDES permitting.

A number of key terms are relevant to application of Resolution 68-16 and 40 CFR 131.12 to this Order. These terms are described below.

**High Quality Waters:** Resolution 68-16 applies whenever “existing quality of water is better than quality established in policies as of the date such policies become effective,”<sup>37</sup> and 40 CFR 131.12 refers to “quality of waters [that] exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation.” Such waters are “high quality waters” under the state and federal antidegradation policies. In other words, high quality waters are waters with a background quality of better quality than that necessary to protect beneficial uses.<sup>38</sup> The Water Code directs the State Water Board and the Regional Water Boards to establish water quality objectives for the reasonable protection of beneficial uses. Therefore, where water bodies contain levels of water quality constituents or characteristics that are better than the established water quality objectives, such waters are considered high quality waters.

Both state and federal guidance indicates that the definition of high quality waters is established by constituent or parameter [State Water Board Order WQ 91-10; USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 CFR 131.12) (“EPA Handbook”)]. Waters can be of high quality for some constituents or beneficial uses but not for others.

In order to determine whether a water body is a high quality water with regard to a given constituent, the background quality of the water body unaffected by the discharge must be compared to the water quality objectives. If the quality of a water body has declined since the adoption of the relevant policies and that subsequent lowering was not a result of regulatory action consistent with the state antidegradation policy, a baseline representing the historically higher water quality may be an appropriate representation of background.<sup>39</sup> However, if the decline in water quality was permitted consistent with state and federal antidegradation policies, the most recent water quality resulting from permitted action constitutes the relevant baseline for determination of whether the water body is high quality (see, e.g., SWRCB Order WQ 2009-0007 page 12). Additionally, if water quality conditions have improved historically, the current higher water quality would again be the point of comparison for determining the status of the water body as a high quality water.

**Best Practicable Treatment or Control:** Resolution 68-16 requires that, where degradation of high quality waters is permitted, best practicable treatment or control (BPTC) limits the amount of degradation that may occur. Neither the Water Code nor Resolution 68-16 defines the term “best practicable treatment or control.”

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nonpoint sources are needed to provide attainment of State water quality standards (See CWA Section 319). States may adopt enforceable requirements, or voluntary programs to address nonpoint source pollution. Section 40 CFR 131.12(a)(2) does not require that States adopt or implement best management practices for nonpoint sources prior to allowing point source degradation of a high quality water. However, States that have adopted nonpoint source controls must assure that such controls are properly implemented before authorization is granted to allow point source degradation of water quality.” Accordingly, in the context of nonpoint discharges, the BPTC standard established by state law controls.

<sup>37</sup> Such policies would include policies such as State Water Board Resolution 88-63, Sources of Drinking Water Policy, establishing beneficial uses, and water quality control plans.

<sup>38</sup> USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 CFR 131.12) , defines “high quality waters” as “those whose quality exceeds that necessary to protect the section 101(a)(2) goals of the Act [Clean Water Act], regardless of use designation.”

<sup>39</sup> The state antidegradation policy was adopted in 1968, therefore water quality as far back as 1968 may be relevant to an antidegradation analysis. For purposes of application of the federal antidegradation policy only, the relevant year would be 1975.

Despite the lack of a BPTC definition, certain State Water Board water quality orders and other documents provide direction on the interpretation of BPTC. The State Water Board has stated: “one factor to be considered in determining BPTC would be the water quality achieved by other similarly situated dischargers, and the methods used to achieve that water quality” (see Order WQ 2000-07, pages 10-11). In a “Questions and Answers” document for Resolution 68-16 (the Questions and Answers Document), BPTC is interpreted to additionally include a comparison of the proposed method to existing proven technology; evaluation of performance data (through treatability studies); comparison of alternative methods of treatment or control, and consideration of methods currently used by the dischargers or similarly situated dischargers.<sup>40</sup> The costs of the treatment or control should also be considered. Many of the above considerations are made under the “best efforts” approach described later in this section. In fact, the State Water Board has not distinguished between the level of treatment and control required under BPTC and what can be achieved through “best efforts.”

The Regional Water Board may not “specify the design, location, type of construction, or particular manner in which compliance may be had with [a] requirement, order, or decree” (Water Code 13360). However, the Regional Water Board still must require the dischargers to demonstrate that the proposed manner of compliance constitutes BPTC (SWRCB Order WQ 2000-7). The requirement of BPTC is discussed in greater detail below.

**Maximum Benefit to People of the State:** Resolution 68-16 requires that where degradation of water quality is permitted, such degradation must be consistent with the “maximum benefit to people of the state.” Only after “intergovernmental coordination and public participation” and a determination that “allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located” does 40 CFR 131.12 allow for degradation.

As described in the Question and Answers Document, factors considered in determining whether degradation of water quality is consistent with maximum benefit to people of the State include economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. With reference to economic costs, both costs to the dischargers and the affected public are considered. Closely related to the BPTC requirement, consideration must be given to alternative treatment and control methods and whether lower water quality can be abated or avoided through reasonable means, and the implementation of feasible alternative treatment or control methods should be considered.

USEPA guidance clarifies that the federal antidegradation provision “is not a ‘no growth’ rule and was never designed or intended to be such. It is a policy that allows public decisions to be made on important environmental actions. Where the state intends to provide for development, it may decide under this section, after satisfying the requirements for intergovernmental coordination and public participation, that some lowering of water quality in “high quality waters” is necessary to accommodate important economic or social development” (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Chapter 4). Similarly, under Resolution 68-16, degradation is permitted where maximum benefit to the people of the state is demonstrated.

**Water Quality Objectives and Beneficial Uses:** As a floor, any degradation permitted under the antidegradation policies must not cause an exceedance of water quality objectives or a pollution or nuisance. Furthermore, the NPS Policy establishes a floor for all water bodies in that implementation programs must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses. This Order allows a set time period in which the Dischargers exceed water quality objectives while establishing the controls and treatment required to meet those objectives.

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<sup>40</sup> See Questions and Answers, State Water Resources Control Board, Resolution 68-16 (February 16, 1995).

**Waters that are Not High Quality: The “Best Efforts” Approach**

Where a water body is at or exceeding water quality objectives already, it is not a high quality water and is not subject to the requirements of the antidegradation policy. Data collected by the Central Valley Water Board, dischargers, federal and State agencies, and others demonstrate that water bodies receiving discharge from the GBP are already impaired for some constituents associated with irrigated agricultural activities.

The “best efforts” approach involves the Regional Water Board establishing limitations expected to be achieved using reasonable control measures. Factors which should be analyzed under the “best efforts” approach include the effluent quality achieved by other similarly situated dischargers, the good faith efforts of the discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance (SWRCB Order WQ 81-5, page 7). The State Water Board has applied the “best efforts” factors in interpreting BPTC (see SWRCB Order Nos. WQ 79-14, and WQ 2000-07).

**B. Application of Resolution 68-16 Requirements to this Order**

The determination of a high quality water within the meaning of the antidegradation policies is water body and constituent-specific.

As stated above, some water bodies receiving discharge from the GBP are already impaired for some constituents. Those same receiving water bodies meet objectives for particular constituents and would be considered “high quality waters” with respect to those constituents.

The temporary degradation of Mud Slough (north) and the San Joaquin River between Mud Slough (north) and the Merced River is allowed through policies established in the Basin Plan. This temporary degradation is allowed because: 1) the continuation of the GBP discharges diverts drainage away from Salt Slough and the wetland water supply channels listed in Appendix 40, as afforded by the regional drainage management project, and has long-term environmental benefits to the wildlife utilizing this portion of the Pacific Flyway and the Grasslands Ecological Area; 2) the farm-based economy of the area would be adversely affected by the discontinuation of the GBP; and 3) it provides time for the development of regional drainage management capability to meet water quality objectives.

Any application of the antidegradation requirements must account for the fact that at least some of the waters into which the subsurface agricultural wastes discharge are high quality waters for some constituents. Further, the Order provisions should also account for the fact that even where a water body is not high quality (such that discharge into that water body is not subject to the antidegradation policy), the board should, under State Water Board precedent, impose limitations more stringent than the objectives set forth in the Basin Plan, if those limits can be met by “best efforts.”

The WDR and MRP for the Grassland Bypass Project are intended to allow a means for Grassland Area Farmers to implement measures to meet the discharge and receiving limitations, and eventually the water quality objectives for the San Joaquin River. Continuation of the Project will allow water quality to improve by the implementation of “best effort” measures by the Grassland Area Farmers.

**C. Consistency with BPTC and the “Best Efforts” Approach**

Due to the numerous commodities being grown, the different water management systems in place and the regional nature of the problem, identification of a specific technology or treatment device as BPTC or “best efforts” has not been accomplished. The Central Valley Water Board recognizes that there is often site-specific, crop-specific, and regional variability that affects the selection of appropriate management practices, as well as design constraints and pollution-control effectiveness of various practices. In addition, the board recognizes that the gains made in previous years in the area served by the GBP are a result of a combination of individual grower improvements, improvements made at the district level, and regional efforts.

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The GBP needs the flexibility to explore, implement and evaluate control and treatment measure that best achieve performance expectations. These control and treatment measures will operate on a regional basis to lower the discharge loads of selenium, salts and boron. More than one means of control or treatment has been and will likely continue to be required for these constituents in order to meet the water quality objectives for the San Joaquin River.

There is no specific set of technologies or treatment devices that can be said to achieve BPTC/best efforts universally in the watershed considering the crop variety and factors (e.g., water allocation) affecting individual farms in the Grassland Drainage Area. The Basin Plan in Chapter IV, page IV-31.00 states:

1. "In developing control actions for selenium, the Regional Board will utilize a priority system which focuses on a combination of sensitivity of the beneficial use to selenium and the environmental benefit expected from the action.
2. Control actions which result in selenium load reductions are most effective in meeting water quality objectives.
3. With the uncertainty in the effectiveness of each control action, the regulatory program will be conducted as a series of short-term actions that are designed to meet long-term water quality objectives.
4. Best management practices such as water conservation measures, are applicable to the control of agricultural subsurface drainage."

The efforts of the Grassland Area Farmers to 1) limit the discharge from the Grassland Drainage Area; 2) the projects initiated under the San Joaquin River Improvement Project; and 3) the reuse of subsurface drainage is considered "best efforts" by the Central Valley Water Board. These efforts have lowered the selenium loading from the GBP to the San Joaquin River so that a section of the San Joaquin River has been delisted for selenium under 303(d).

BPTC is not defined in Resolution 68-16. However, the State Water Board describes in their 1995 Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g., through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers." Measures have been implemented by the Grassland Area Farmers to eliminate tailwater from the Grassland Bypass Channel and to test different technologies for selenium removal at the SJRIPP treatment facility. These measures and other implemented actions to achieve discharge and effluent limitations constitute BPTC/best efforts.

- As part of California's Nonpoint Source Pollution Control Program, the State Water Board, California Coastal Commission, and other state agencies have identified seven management measures to address agricultural nonpoint sources of pollution that affect state waters (*California's Management Measures for Polluted Runoff*, referred to below as "Agriculture Management Measures").<sup>41</sup> The agricultural management measures include practices and plans installed under various NPS programs in California, including systems of practices commonly used and recommended by the USDA as components of resource management systems, water quality management plans, and agricultural waste management systems.
- USEPA's National Management Measures to Control Nonpoint Source Pollution from Agriculture (EPA 841-B-03-004, July 2003);<sup>42</sup> "is a technical guidance and reference document for use by

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<sup>41</sup> *California's Management Measures for Polluted Runoff*  
([http://www.waterboards.ca.gov/water\\_issues/programs/nps/docs/cammpr/info.pdf](http://www.waterboards.ca.gov/water_issues/programs/nps/docs/cammpr/info.pdf))

<sup>42</sup> *National Management Measures to Control Nonpoint Source Pollution from Agriculture*  
([http://water.epa.gov/polwaste/nps/agriculture/agmm\\_index.cfm](http://water.epa.gov/polwaste/nps/agriculture/agmm_index.cfm))

State, local, and tribal managers in the implementation of nonpoint source pollution management programs. It contains information on the best available, economically achievable means of reducing pollution of surface and ground water from agriculture.”

Discharges from the GBP to surface waters consist primarily of subsurface agricultural drainage and stormwater runoff from agricultural lands. Both of the above guidance documents describe a series of management measures. The agricultural management measures described in the state and USEPA reference documents generally include: 1) erosion and sediment control, 2) facility wastewater and runoff from confined animal facilities, 3) nutrient management, 4) pesticide management, 5) grazing management, 6) irrigation water management, and 7) education and outreach. A comparison of the recommendations with the management practices implemented by the Dischargers and GAF is provided below.

- *Management measure 1, erosion and sediment control.* The Order places limits on the maximum flow rate in the San Luis Drain to prevent scouring and the mobilization of drain sediments. The Use Agreement states that “[t]o avoid re-suspending sediment in the Drain, the maximum rate of flow in the Drain shall be 150 cfs” and that “[u]nder normal operations, flows will be slow enough to not cause sediment movement.” In addition, Grassland Area Farmers are not allowed to discharge tailwaters into water district canals.
- *Management measure 2 is not applicable,* as this Order does not address waste discharges from confined animal facilities.
- *Management measure 3, nutrient management.* As described in the State’s Agricultural Management Measures document, “this measure addresses the development and implementation of comprehensive nutrient management plans for areas where nutrient runoff is a problem affecting coastal waters and/or water bodies listed as impaired by nutrients.” Where nutrients are causing exceedances of water quality objectives in surface waters, this Order would require development of a detailed SQMP which would address sources of nutrients and require implementation of practices to manage nutrients. Collectively, these requirements work together in a manner consistent with management measure 3.
- *Management measure 4, pesticide management.* As described in the State’s Agricultural Management Measures document, this measure “is intended to reduce contamination of surface water from pesticides.” The Grassland Area Farmers are to implement practices that minimize waste discharge to surface water (such as pesticides), prevent pollution and nuisance, and achieve and maintain water quality objectives.
- *Management measure 5, grazing management.* is not applicable, as the Grassland Drainage Area contains minimal acreage used for grazing.
- *Management measure 6, irrigation water management.* As described in the state Agricultural Management Measures document, this measure “promotes effective irrigation while reducing pollutant delivery to surface and ground waters.” The Grassland Area Farmers are not allowed to discharge tailwater into the Grassland Bypass Channel. Control and treatment technologies are being explored to minimize the release of selenium and salts to the discharge point. Reuse of the subsurface drainage is also being utilized to meet effluent and discharge limitations and eventually the water quality objective.
- *Management measure 7, education and outreach.* The Order requires that the Dischargers meet specific performance standards and deadlines. The Dischargers have used education and outreach to the Grassland Area Farmers in the past to inform growers of projects in the SJRIP and monitoring results for salinity and selenium. It is anticipated that this approach will be used, as necessary, in the future.

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Implementation of actions to achieve the Order’s effluent and receiving water limitations described above are consistent with the state and federal guidance for management measures.

Implementation of these measures for compliance with the requirements of the Order will lead to implementation of BPTC/best efforts by the Project

1. Additional Planning and Implementation Measures (SQMPs)

This Order requires development of surface water quality management plans where degradation trends are observed that threaten to impair a beneficial use or where beneficial uses are impaired (i.e., water quality objectives are not being met). SQMPs include requirements to investigate sources, develop strategies to implement actions to ensure waste discharges are meeting the Orders effluent and receiving water limitations, and implement a monitoring strategy to provide feedback on the effectiveness of the management plan. In addition, the SQMPs must include actions to "Identify, validate, and implement management practices to reduce loading of COC's [constituents of concern] to the subsurface agricultural discharge, thereby improving water quality" (see Appendix MRP-1). Under these plans, additional actions or technology will be implemented in an iterative manner, to ensure that the measures represent BPTC/best efforts and that degradation does not threaten beneficial uses. The SQMPs need to meet the performance standards set forth in this Order. The SQMPs are also reviewed periodically to determine whether adequate progress is being made to address the degradation trend or impairment. If adequate progress is not being made, then the Executive Officer can require field monitoring studies. or the board may revoke the coverage under this Order.

It is also important to note that in some cases, other agencies may establish performance standards that are equivalent to BPTC and may be relied upon as part of a SQMP. For example, the Bureau may remove, at its discretion, sediment and organic materials deposited in the Drain at any time during the term of its present Use Agreement.

The State Water Board indicates in its Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger should evaluate performance data, e.g., through treatability studies..." Water quality management plans, referred to as SQMPs above, institute an iterative process whereby the effectiveness of any measures taken to minimize will be periodically reevaluated as necessary and/or as more recent and detailed water quality data become available. The Dischargers are also required in the WDR to submit annually a Drainage Management Plan that details the specific control or treatment methods implemented for subsurface drainage to comply with water quality objectives contained in the Basin Plan for discharges from the GBP. This process of reviewing data and instituting additional measures where necessary will continue to assure that BPTC/best efforts are implemented and will facilitate the collection of information necessary to demonstrate the performance of the measures. This iterative process will also ensure that the highest water quality consistent with maximum benefit to the people of the state will be maintained.

Resolution 68-16 does not require Dischargers to use technology that is better than necessary to prevent degradation (as evaluated on a constituent by constituent basis). As such, the board presumes that the requirements of this Order are sufficiently achieving BPTC for constituents and locations where degradation is not occurring.

**D. Summary**

The Dischargers are required to implement measures to meet the above goals and periodically review the effectiveness of implemented measures and make improvements where necessary. Also, the Order requires water quality monitoring and assessments aimed to identify trends, evaluate effectiveness of management practices, and detect exceedances of water quality objectives. The process of periodic review of SQMPs, review of monitoring data, and updates to the Drainage Management Plan provides mechanisms for the board to better ensure that the Dischargers are meeting the requirements of the Order.

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The Order is designed to achieve site-specific antidegradation and antidegradation-related requirements through implementation of BPTC/best efforts as appropriate and monitoring, evaluation, and reporting to confirm the effectiveness of the BPTC/best efforts measures in achieving their goals. The Order relies on implementation of control and treatment technologies that constitute BPTC/best efforts, based to the extent possible on existing data, and requires the water quality monitoring to ensure that the selected measures in fact constitute BPTC where degradation of high quality waters is or may be occurring, and best efforts where waters are already degraded.

This Order allows limited degradation of existing high quality waters while best efforts measures are being implemented. The Basin Plan sets performance goals to meet water quality objectives while these measures are being implemented. This limited degradation is consistent with maximum benefit to the people of the state for the following reasons:

- At a minimum, this Order requires that the effluent and receiving waters achieve and maintain compliance with the discharge limitations in the Basin Plan and protect existing beneficial uses;
- The requirements implementing the Order will result in use of BPTC where waste discharges may cause degradation of high quality waters. Where waters are already degraded, the requirements will result in pollution controls that reflect the “best efforts” approach. Confirmation of BPTC/best efforts will be shown by monitoring data.
- Consistent with the Order’s stated goal of ensuring subsurface agricultural discharges do not impair access to safe and reliable drinking water, the Order protects high quality waters relied on by local communities from degradation of their water supplies by current practices in the Grassland Drainage Area. The Order is designed to prevent subsurface discharges from the Grassland Drainage Area from causing or contributing to exceedances of water quality objectives, which include maximum contaminant levels for drinking water. The Order also is designed to detect and address exceedances of water quality objectives, if they occur, in accordance with the compliance time schedules provided therein. Therefore, local communities should not incur any additional treatment costs associated with the limited degradation authorized by this Order; and
- The Order includes performance standards that will work to prevent further degradation of surface water quality.

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The requirements of the Order and the limited degradation that would be allowed are consistent with State Water Board Resolution 68-16. The requirements of the Order will result in the implementation of best efforts necessary to assure no further degradation of water quality with the maximum benefit to the people of the state. The water limitations in section II of the Order, the compliance schedules in section II and the Basin Plan, and the Monitoring and Reporting Program’s requirements to track compliance with the Order, are designed to ensure that further degradation of water quality will not occur and that the limited degradation will not unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. Finally, the iterative process of reviewing data and instituting additional measures when necessary will ensure that the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

### **XIII. California Water Code Section 13141**

The Phase III EIR/EIS examined the socioeconomic impacts to the region under three scenarios: 1) No Action Alternative; 2) Proposed Action; and 3) Alternate Action. The No Action Alternative assumed termination of the GBP. The Proposed Action would implement the 2009 Use Agreement conditions for the GBP. The Alternative Action examined a continuation of the GBP, but at the level set in the 2001 Use Agreement.

The key farm-level variable used for measurement of impact significance was farm profit. Farm profit summarizes the effects of an alternative on the long-run viability of farming in the area and was measured relative to estimated 2007 existing conditions. All three alternatives examined the projected

effects from 2010 to 2019. Each alternative had negative annual impacts when compared to the 2007 existing conditions. The most extreme impact was the No Action Alternative which soil and water salinity would increase, crop yields and revenues would decline, acreages would shift among crops, but total cropped acreage would remain very similar between 2010 and 2019. The economic impact between the Proposed Alternative and the Alternative Action were insignificant.

The Alternative Action would not lower selenium levels below those set in the 2001 Use Agreement. The Proposed Action would lower these levels in accordance with the 2009 Use Agreement, which would lower selenium loading significantly below the TMML and improve the water quality of the lower San Joaquin River.

#### **XIV. California Water Code Section 13263**

California Water Code section 13263 requires that the Central Valley Water Board consider the following factors, found in section 13241, when considering adoption of waste discharge requirements.

(a) Past, present, and probable future beneficial uses of water

The Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan) identifies applicable beneficial uses of surface within the Sacramento River Basin, including the Grassland Watershed. Identified beneficial uses for Salt Slough, Mud Slough (north) and wetland water supply channels include irrigation,<sup>43</sup> stock watering, contact recreation, other noncontact recreation, warm freshwater habitat, warm spawning, wildlife habitat, commercial use, and shellfish. The Order protects the beneficial uses identified in the Basin Plan. Applicable past, present, and probable future beneficial uses of the Grassland Watershed waters were considered by the Central Valley Water Board as part of the Basin Planning process and are reflected in the Basin Plans themselves. Mud Slough, the San Joaquin River and the wetland supply channels, the water bodies subject to discharges from the area served by the GBP, are all listed in the Basin Plan along with their designated beneficial uses.

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(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto

Environmental characteristics of the Grassland watershed have been considered in the development of this Order. This information is contained in the *August 2009 Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019*.

(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area

This Order provides a process to review these factors during implementation of water quality management plans (SQMPs). The Order requires that agricultural subsurface discharges to surface water do not cause or contribute to an exceedance of applicable discharge limitations set in the Basin Plan or to water quality objectives. SQMPs are required in areas where discharge limitations or water quality objectives are not being met and are not being addressed by existing SQMPs. Under these plans, sources of waste must be estimated along with background water quality to determine what options exist for reducing waste discharge to ensure that the Project is in compliance with water limitations and objectives. The SQMPs must be designed to ensure that agricultural subsurface discharges do not cause or contribute to an exceedance of water limitations or a water quality objective set in the Basin Plan, and meet other applicable requirements of the Order, including, but limited to, section II.

(d) Economic considerations

The EIR/EIS for the Project from 2010 to 2019 anticipated economic effects to be farm income linked to farm investment and consumption. Regional economic activity would be affected due to the

<sup>43</sup> Basin Plan footnote for Mud Slough (north) and wetland water supply channels states "[e]levated natural salt and boron concentrations may limit this use to irrigation of salt and boron tolerant crops. Intermittent low flow conditions may also limit this use."

linkages between production agriculture and a myriad of other sectors of the economy. This Order allows for the continuation of farm activities and the use of the Drain. Costs for this Order into Phase III of the Project are borne by the farmers in the Grassland Drainage Area. Implementation of this Order is expected to increase farm profits from crop production compared to the No Action alternative (no use agreement for the Drain) until 2015 when an anticipated treatment facility is operational and annual costs will decrease farm profits. The decrease in profits is estimated to fall slight below profits from the No Action alternative for the period from 2015 to 2019. This Order will not unreasonably affect the Grassland Area Farmers or region adversely.

(e) The need for developing housing within the region

This Order establishes waste discharge requirements for subsurface agricultural discharges and stormwater runoff from the area served by the Grassland Bypass Project, where the land use is primarily irrigated agriculture. The Order is not intended to establish requirements for any facilities that accept wastewater from residences or stormwater runoff from residential areas. This Order will not affect the development of housing within the region.

(f) The need to develop and use recycled water

This Order does not establish any requirements for the use or purveyance of recycled wastewater. The SJRIP treatment facility will treat subsurface drainage and plans to recycle the treated lower selenium/salt effluent back into the fields where the drainage originated. No waste discharge requirements will be required for this pilot facility since the discharge will be recycled into essentially a closed loop system (see Figure 12).

The GAF and water districts have been recycling water by using tailwater recovery systems and by blending subsurface drainage with irrigation water. The subsurface drainage is also recycled to wet roads for dust controls.

Revisions by USBR SCC-107 submitted June 30, 2014

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**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION**

**ORDER R5-2014-XXXX**

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER  
FOR**

**SAN LUIS & DELTA-MENDOTA WATER AUTHORITY  
AND  
UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION**

**SURFACE WATER DISCHARGES FROM THE  
GRASSLAND BYPASS PROJECT  
FRESNO AND MERCED COUNTIES**

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Attachment 1: Description of Lands Served by Project

Attachment A: Information Sheet

Attachment B: Monitoring and Reporting Program Order (contains appendix)

Attachment C: Definitions, Acronyms, and Abbreviations

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION**

**ORDER R5-2014-XXXX**

**WASTE DISCHARGE REQUIREMENTS  
FOR  
SAN LUIS & DELTA-MENDOTA WATER AUTHORITY  
AND  
UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SURFACE WATER DISCHARGES FROM THE  
GRASSLAND BYPASS PROJECT  
FRESNO AND MERCED COUNTIES**

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The California Regional Water Quality Control Board, Central Valley Region (hereafter, Central Valley Water Board or board), finds that:

**Findings**

**SCOPE AND COVERAGE OF THIS ORDER**

1. The San Luis and Delta-Mendota Water Authority (Authority) submitted a Report of Waste Discharge dated 30 December 2008 for Phase III of the Grassland Bypass Project. This project, which started operations on 23 September 1996, transports subsurface agricultural drainage, tailwater and storm water runoff via the Grassland Bypass Channel to a portion of the San Luis Drain (Drain) that discharges to Mud Slough (north), a tributary of the San Joaquin River. The Drain is owned by the United States Department of the Interior, Bureau of Reclamation (Bureau), and is operated by the Authority. Hereafter, the Authority and Bureau will be jointly referred to as the Discharger.
2. This Order only addresses the portions of the Grassland Bypass Project that involves the collection, transport and discharge of agricultural subsurface drainage flows and storm water to surface waters. Discharges to groundwater and surface water from other than agricultural subsurface drainage will be addressed in one or more other Orders to be issued by the Board.
3. This Order covers elements of Phase III of the Grassland Bypass Project. The Authority previously submitted Reports of Waste Discharge dated 25 August 1997 and 9 February 2001 for Phases I and II of the Grassland Bypass Project. Phase I was regulated by the board's waste discharge requirements Order No. 98-171 adopted on 24 July 1998. Phase II is regulated by waste discharge requirement Order No. 5-01-234 adopted on 7 September 2001.
4. An Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was approved for the Phase III of the Grassland Bypass Project for the period from 2009 to 2019.<sup>1</sup>

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<sup>1</sup> Entrix, August 2009. *Final Grassland Bypass Project 2010-2019, Environmental Impact Statement and Environmental Impact Report*. Prepared for: U.S. Bureau of Reclamation and San Luis & Delta-Mendota Water Authority. State Clearinghouse No. 2007121110.

5. The Grassland Bypass Project currently serves approximately 97,400 acres of farmland and is designed to route subsurface agricultural drainage containing high levels of selenium and other constituents around wetlands in the Grassland Watershed. This drainage previously flowed through a variety of channels to wetland habitat before discharging to the San Joaquin River.
6. The Grassland Bypass Channel is a four-mile long earthen ditch that links the combined discharges from the Grassland Drainage Area to the Drain. The Drain is an 85-mile long, trapezoidal concrete canal that starts near Five Points in Fresno County and generally runs northwest to its terminus at the northern end of the former Kesterson Reservoir near Gustine in Merced County.

Only the lower 28 miles of the Drain, starting at the point where it intersects the Grassland Bypass Channel approximately one half mile west of Russell Avenue, are being used as part of the Grassland Bypass Project. The Drain has been blocked above this point and the Authority is operating the system to keep other drainage from entering the portion of the Drain being used by the Grassland Bypass Project.

7. The Grassland Bypass Project primarily transports and discharges subsurface agricultural drainage flows. Approximately 38,700 acres of the Grassland Drainage Area have subsurface drains that collect shallow groundwater that is generally characterized as being high in salts, boron, selenium and other constituents. Storm water runoff may also enter the drainage system. Tailwater returns are not allowed in the Drain.
8. Phase III of the Grassland Bypass Project will continue to implement the strategy of previous phases, including:
  - a. separating drainage discharged from the Grassland Drainage Area from wetland water supply conveyance channels for the period from 2010 to 2019;
  - b. facilitating the drainage management that maintains the viability of agriculture in the Grassland Drainage Area while maintaining water quality improvement achievements of the previous phases in the San Joaquin River; and
  - c. investigating the technical and economic feasibility of including agricultural subsurface drainage treatment as part of a complete tool set to achieve and maintain water quality objectives for selenium and salt in the San Joaquin River, Salt Slough, Mud Slough (north) and the wetland water supply channels identified in the Basin Plan's Appendix 40.
9. The Central Valley Water Board has adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento River and San Joaquin River Basins* (Basin Plan), which designates beneficial uses, establishes water quality objectives and contains implementation plans and policies for waters of the Sacramento and San Joaquin Basins. The requirements in the Order implement the Basin Plan.
10. The beneficial uses of Mud Slough (north), as identified in the Basin Plan, are: limited irrigation supply, stock watering, water contact recreation and noncontact water recreation, sports fishing, shellfish harvesting, warm water aquatic habitat, warm water spawning and wildlife habitat.
11. The Basin Plan contains the following timetable for meeting performance goals and water quality objectives for selenium in Mud Slough (north) and the San Joaquin River. A prohibition of discharge and waste discharge requirements will be used to control agricultural subsurface drainage discharges containing selenium unless water quality objectives for selenium are being met. The table below lists the performance goal and water quality objective for selenium with the time schedule for compliance as specified in the Basin Plan.

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Compliance Time Schedule for Selenium  
 (4-day Average and Monthly Mean)

Selenium Water Quality Objectives (in **bold**) and Performance Goals (in *italics*)

| Water Body                                                                                      | 31 December 2015            | 31 December 2019            |
|-------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|
| Mud Slough (north) and the San Joaquin River from the Mud Slough Confluence to the Merced River | <i>15 µg/L monthly mean</i> | <b>5 µg/L 4-day average</b> |

12. The Basin Plan contains the following prohibition of discharge: “The discharge of selenium from agricultural subsurface drainage systems in the Grassland Watershed to the San Joaquin River is prohibited in amounts exceeding 8,000 lbs/year for all water year types beginning 10 January 1997.” The Drain carries all of the subsurface agricultural drainage discharged from the Grassland Watershed.
13. The Central Valley Water Board has identified the San Joaquin River as a water quality limited segment with respect to selenium. Section 303(d) of the Federal Clean Water Act requires the development of a Total Maximum Daily Load (TMDL) where existing effluent limitations are not stringent enough to meet water quality standards. The August 2001 Staff Report titled *Selenium Total Maximum Daily Load for the Lower San Joaquin River* contains a TMDL designed to meet the Clean Water Act requirements. The TMDL establishes monthly load limits (TMML values) that represent the total load that the San Joaquin River can assimilate without exceeding the applicable water quality objective at a specified frequency.

The U.S. EPA allows violations of standards at a frequency no greater than once every three years. The TMML is apportioned among background sources of selenium (wetlands, the Merced River, and the San Joaquin River upstream of Salt Slough), a margin of safety (established as 10% of the TMML), and a load allocation (discharges from the Grassland Drainage Area). Table 2 shows the calculated monthly load allocation for selenium from the Grassland Drainage Area.

The water year classification will be established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification<sup>2</sup> at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series. The previous year’s classification will apply until an estimate is made of the current water year.

14. The *Agreement for Use of the San Luis Drain* (Use Agreement) between the Bureau and Authority contains terms and conditions that address Grassland Bypass Project longevity and water quality. Monthly and annual limits were placed on the loads of selenium that could be discharged and an extensive, multi-agency monitoring program was established. An updated Use Agreement<sup>3</sup> (2010 Use Agreement) was signed in 2009, extending the Grassland Bypass Project through December 31, 2019.

<sup>2</sup> As defined in Footnote 17 for Table 3 in the State Water Resources Control Board’s *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, May 1995.

<sup>3</sup> *Agreement for Continued Use of the San Luis Drain for the Period January 1, 2010 through December 31, 2019*. Agreement No. 10-WC-20-3975.

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15. The Use Agreement also designates the Authority to be responsible for implementing a comprehensive monitoring program to provide water quality data for purposes of determining compliance with selenium load values and salinity load values.<sup>4</sup>
16. The Use Agreement contains calculated selenium load limits for the Grassland Bypass Project. The load limits are designed to meet the Total Maximum Monthly Load (TMML) limits. Load limit reductions below TMML levels start in 2016 as agreed to by the Dischargers under the terms of the 2010 Use Agreement. The reductions between current load limits and the TMML load limits result in a gradual reduction in loading. In the event that the board and U.S. EPA adopt revised TMML values, the Use Agreement selenium load values may be revised as described in the Use Agreement to meet the new TMML values.
17. The Drain contains sediment that was deposited before the start of the Grassland Bypass Project. This sediment contains trace elements at concentrations that are higher than those found in average California soils and, if flushed from the Drain, would pose a threat to receiving waters. The effluent limits apply to selenium from the sediment as well as selenium in drainage water from the Grassland Drainage Area.
18. The Basin Plan also contains numerical objectives for boron and molybdenum that apply to the San Joaquin River from the mouth of the Merced River to Vernalis and to Mud Slough (north) as shown in the table below:

Boron and Molybdenum Water Quality Objectives

| Constituent       | Time Period                   | Monthly Mean | Maximum Concentration | Applicable Water Bodies                                                      |
|-------------------|-------------------------------|--------------|-----------------------|------------------------------------------------------------------------------|
| Boron (mg/L)      | 15 March through 15 September | 0.8          | 2.0                   | San Joaquin River, mouth of the Merced River to Vernalis                     |
|                   | 16 September through 14 March | 1.0          | 2.6                   |                                                                              |
|                   | Critical Year                 | 1.3          |                       |                                                                              |
| Molybdenum (µg/L) |                               | 19           | 50                    | Mud Slough (north), San Joaquin River from Sack Dam to mouth of Merced River |
|                   |                               | 10           | 15                    | San Joaquin River, mouth of the Merced River to Vernalis                     |

19. Subsurface agricultural drainage from the Grassland Drainage Area is high in boron and molybdenum and discharges from the Drain are resulting in violations of these objectives. This drainage has historically flowed to Mud Slough (north) via other channels and the steps taken to meet the load limits in this Order for selenium discharges are expected to result in reductions in boron and molybdenum discharges.
20. The Basin Plan contains objectives for toxicity and other water quality parameters that apply to this discharge.

<sup>4</sup> U.S. Bureau of Reclamation, U.S. Environmental Protection Agency (U.S. EPA), U.S. Fish and Wildlife Service, U.S. Geological Survey, Central Valley Water Board, California Department of Fish and Wildlife (CDFW), and the San Luis & Delta-Mendota Authority. *2013 Revised Monitoring Program for the Continued Operation of the Grassland Bypass Project*. August 2009

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21. The Grassland Bypass Project is part of a long-term effort to improve the management of agricultural subsurface drainage discharges in the Grassland Watershed. The primary focus of the Grassland Bypass Project has been on the control of the selenium, but the discharge is also causing or contributing to the violations of water quality objectives for other constituents in Mud Slough (north) and the San Joaquin River. Since the Grassland Bypass Project involves consolidation and rerouting of drainage rather than a new discharge, this Order will address this situation through the development and implementation of drainage management plans that will reduce constituent loads.
22. The Basin Plan's selenium control program states that all those discharging or contributing to the generation of agricultural subsurface drainage will be required to submit for approval a Long Term Drainage Management Plan (LTDMP) designed to meet final water quality objectives. Order No. 98-171 required the Discharger to prepare a LTDMP and to update it annually. This Order requires the Discharger to continue to update the plan annually as the "Drainage Management Plan".

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#### REASON FOR THE CENTRAL VALLEY WATER BOARD ISSUING THIS ORDER

23. The Central Valley Water Board's authority to regulate waste discharges that could affect the quality of the waters of the state, which includes both surface water and groundwater, is found in the Porter-Cologne Water Quality Control Act (California Water Code Division 7).
25. Water Code section 13267(b)(1) states: *"(1) In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. (2) When requested by the person furnishing a report, the portions of a report that might disclose trade secrets or secret processes may not be made available for inspection by the public but shall be made available to governmental agencies for use in making studies. However, these portions of a report shall be available for use by the state or any state agency in judicial review or enforcement proceedings involving the person furnishing the report."*
26. Technical reports are necessary to evaluate Dischargers' compliance with the terms and conditions of this Order and to assure protection of waters of the state. Consistent with California Water Code section 13267, this Order requires the implementation of a monitoring and reporting program (MRP) that is intended to determine the effects of waste discharges on water quality, to verify the adequacy and effectiveness of the Order's conditions, and to evaluate the Discharger's compliance with the terms and conditions of the Order. The Discharger must comply with MRP Order R5-2014-XXXX which is part of this Order, and future revisions thereto by the Executive Officer or board.
27. In May 2004, the State Water Board adopted the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy). The purpose of the NPS Policy is

to improve the state's ability to effectively manage NPS pollution and conform to the requirements of the Federal Clean Water Act and the Federal Coastal Zone Act Reauthorization Amendments of 1990. The NPS Policy requires, among other key elements, an NPS control implementation program's ultimate purpose to be explicitly stated. It also requires implementation programs, to at a minimum, address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements.

- 28 This Order constitutes an NPS Implementation Program for the discharges regulated by the Order. Attachment A, Information Sheet, describes the five key elements required by the NPS Policy and provides justification that the requirements of this Order meet the requirements of the NPS Policy. This Order is consistent with the NPS Policy.
- 29 The United States Environmental Protection Agency adopted the National Toxics Rule (NTR) on 5 February 1993 and the California Toxics Rule (CTR) on 18 May 2000, which was modified on 13 February 2001. The NTR and CTR contain water quality criteria which, when combined with beneficial use designations in the Basin Plans, constitute enforceable water quality standards for priority toxic pollutants in California surface waters.

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### CALIFORNIA ENVIRONMENTAL QUALITY ACT

- 30 An Environmental Impact Statement and Environmental Impact Report (EIS/EIR) (State Clearinghouse No. 2007121110) dated August 2009, was prepared for the Grassland Bypass Project for the period 1 October 2010 through 31 December 2019<sup>5</sup>. The U.S. Bureau of Reclamation is the lead agency and issued a Record of Decision.<sup>6</sup> The lead agency pursuant to CEQA (Public Resources Code section 21100 et seq.) was the San Luis & Delta-Mendota Water Authority. A Notice of Determination (NOD) was filed on 12 October 2009.<sup>7</sup>
- 31 The environmental analysis for the Grassland Bypass Project finds that water quality and biota in the last six miles of Mud Slough (north) may be adversely impacted by the project. Without the Grassland Bypass Project, agricultural subsurface drainage is intermittently discharged to Mud Slough (north), while with the Grassland Bypass Project it will be continuously discharged to Mud Slough (north). The Grassland Bypass Project has demonstrated significant water and habitat quality improvements in wetland water supply channels, and further mitigation actions are incorporated into the Use Agreement specifically to offset the impacts to Mud Slough (north). The board may invoke the prohibition of discharge before 31 December 2019 if agreed upon mitigation actions in the Use Agreement are not being carried out in a timely or effective manner. Water quality-related mitigation measures identified in the EIS/EIR documents are listed below.
- a) The proposed project is limited in duration. A biological, water quality, and sediment monitoring program will be implemented during the life of the project to evaluate the impact of the project. If unacceptable problems or impacts are identified, appropriate actions will be developed.

<sup>5</sup> Entrix, 2009. *Final Grassland Bypass Project Environmental Impact Statement/Environmental Impact Report*. Prepared for the Bureau of Reclamation, Sacramento and Fresno, CA, and the San Luis Delta-Mendota Water Authority. August 2009.

<sup>6</sup> ROD-07-141 dated December 2009.

<sup>7</sup> NOD filed for the Grassland Bypass Project, 2010-2019, State Clearinghouse Number 2007121110.

- b) Drainage from the Grassland Drainage Area will be removed from 6.6 miles of the San Joaquin River [between Salt Slough and Mud Slough (north) confluence] and 93 miles of wetland water supply channels as defined in Appendix 40 of the Basin Plan.
- c) The amount of drainage water discharged to the San Joaquin River system will be reduced to meet Basin Plan water quality objectives. A plan will be submitted by the drainage entities to the Central Valley Water Board, which outlines drainage reduction efforts and the use of the Drain as a drain water conveyance facility as part of the overall program to effectively manage and monitor agricultural drainage discharges. These plans will be submitted on an annual basis.
- d) Drainage will be maintained within the Drain north of Check 19, MP 105.72. Any stormwater and groundwater that has seeped into the San Luis south of Check 19 will be discharged downstream as necessary to prevent overtopping.
- e) The fish barrier maintained by California of Fish and Wildlife (CDFW) will be used during certain periods of the year on the San Joaquin River just upstream of the Merced River. This barrier prevents the straying of salmon to Mud Slough (north) due to the attractive flows caused by the discharge.
- f) The discharge from the Drain to Mud Slough (north) will be operated so as to minimize hydraulic turbulence and erosion within Mud Slough (north). If necessary, bank stabilization shall be undertaken and an energy dissipation structure operated and maintained.
- g) Control structures will be maintained to prevent inflow of drainage from Mud Slough (north) to the CDFW China Island Unit.
- h) The Drain will be operated such that sediments in the Drain are not mobilized. A flow rate not to exceed 1 foot per second has been determined to be the appropriate velocity to achieve this goal. Sediments in the drain will be monitored and will be removed before they exceed hazardous waste levels.
- i) The San Joaquin River Water Quality Improvement Project, created by the Grassland Area Farmers, sets aside more than 6,000 acres to plant salt tolerant crops for drainage reuse. In 2013, approximately 26,000 acre-feet of drain water produced in the Grassland Drainage Area were used to irrigate salt-tolerant crops.
- j) The Grassland Area Farmers are working with the Bureau to develop an In-Valley Treatment/Drainage Reuse plan involving irrigation improvements, seepage reduction, land retirement, recirculation, drainage reuse, and drainage treatment .A demonstration level treatment plant will be used to test treatment methods utilizing subsurface agricultural drainage
- k) The Grassland Bypass Project will supply year-round water to a series of ponds between Mud Slough and the San Joaquin River through existing pipeline to create natural swales for wetland habitat.

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The Central Valley Water Board has considered the above CEQA documents in preparing this Order.

## STATE WATER RESOURCES CONTROL BOARD RESOLUTION 68-16

32 State Water Resources Control Board (State Water Board) Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16 or “antidegradation policy”) requires that a Regional Water Quality Control Board maintain high quality waters of the state unless the board determines that any authorized degradation is consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in a Regional Water Quality Control Board’s policies (e.g., quality that exceeds applicable water quality objectives). The board must also assure that any authorized degradation of existing high quality waters is subject to waste discharge requirements which will result in the best practicable treatment or control (BPTC) of the discharge necessary to assure that pollution, or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

Attachment A to this Order summarizes applicable antidegradation requirements and provides detailed rationale demonstrating how this Order is consistent with Resolution 68-16. As indicated in the summary, this Order authorizes degradation of high quality surface waters, not to exceed water quality performance goals and objectives stated in the Basin Plan, threaten beneficial uses, or cause a condition of pollution or nuisance. The Order will also result in the implementation of best efforts to non-high quality waters and assure that any change in water quality will be consistent with maximum benefit to the people of the state.

As authorized by Water Code section 13263(c), achievement of these requirements is in accordance with the Order’s time schedules. Time schedules are necessary because immediate compliance with limitations for all constituents governed by the Order is not practicable. Using time schedules to implement antidegradation requirements was explicitly recognized and endorsed by the California Court of Appeal, who wrote with respect to the Central Valley Water Board’s Dairy Waste Discharge Requirements that “[a] phased approach... is reasonable, and is authorized by section 13263, which allows the requirements of a regional water quality control board to contain a time schedule.” *AGUA v. Central Valley Water Board*, 210 Cal.App.4th 1255, 1277.

### CALIFORNIA WATER CODE SECTION 13241

- 33 California Water Code section 13263 requires that the Central Valley Water Board consider the following factors, found in section 13241, when considering adoption of waste discharge requirements.
- (a) Past, present, and probable future beneficial uses of water.
  - (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
  - (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
  - (d) Economic considerations.
  - (e) The need for developing housing within the region.
  - (f) The need to develop and use recycled water.

These factors have been considered in the development of this Order. Attachment A, Information Sheet, provides further discussion on the consideration of section 13241 factors.

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### RELATIONSHIP TO OTHER ONGOING WATER QUALITY EFFORTS

- 34 Other water quality efforts conducted pursuant to state and federal law directly or indirectly serve to reduce waste discharges from irrigated lands to waters of the state. Those efforts will continue, and will be supported by implementation of this Order.
- 35 The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten the achievement of water quality objectives in Central Valley surface water. This Order requires actions that will reduce salt discharges in surface water and should result in practices that reduce nitrate loading. The board intends to coordinate all such actions with the CV-SALTS initiative. CV-SALTS may identify additional actions that need to be taken by irrigated agriculture and others to address these constituents. This Order can be amended in the future to implement any policies or requirements established by the Central Valley Water Board resulting from the CV-SALTS process. This Order includes provisions to promote coordination with CV-SALTS and to support the development of information needed for the CV-SALTS process.
- 36 Total Maximum Daily Loads (TMDLs) are established for surface waters that have been placed on the State Water Board's 303(d) list of Water Quality Limited Segments for failure to meet applicable water quality standards. A TMDL, which may be adopted by the Central Valley Water Board as Basin Plan amendments, is the sum of allowable loads of a single pollutant from all contributing point sources and nonpoint sources. The Central Valley Water Board is currently developing a pesticide TMDL and organochlorine pesticide TMDL, among others in development. This Order will implement these and other future TMDLs to the extent there are established requirements that pertain to irrigated agriculture, as well as the following approved TMDLs: San Joaquin River Deep Water Ship Channel dissolved oxygen; San Joaquin River salt, boron, selenium, diazinon, and chlorpyrifos.
- 37 The General Order for Existing Milk Cow Dairies (R5-2007-0035) and NPDES Dairy General Permit CAG015001 (Dairy General Orders) regulates discharges of waste to surface waters and groundwater from existing milk cow dairies in the Central Valley. Discharges from irrigated agricultural parcels are regulated by the Dairy General Orders if the owner or operator of the parcel applies dairy waste from its dairy operation.
- 38 Water quality monitoring is conducted in water bodies surrounding the Grassland Bypass Project by the Westside Coalition of the Irrigated Lands Regulatory Program and the San Joaquin River Restoration Program. This monitoring was considered when designing the updated monitoring and reporting program and data developed through these efforts will be used to help evaluate the impacts of the GBP.

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### ENFORCEMENT FOR NONCOMPLIANCE WITH THIS ORDER

- 39 California Water Code section 13350 provides that any person who violates Waste Discharge Requirements may be: 1) subject to administrative civil liability imposed by the Central Valley Water Board or State Water Board in an amount of up to \$5,000 per day of violation, or \$10 per gallon if the discharge involves a discharge of pollutants; or 2) be subject to civil liability imposed by a court in an amount of up to \$15,000 per day of violation, or \$20 per gallon. The actual calculation and determination of administrative civil penalties must be set forth in a manner that is consistent with the State Water Board's Water Quality Enforcement Policy.

- 40 The State Water Board's Water Quality Enforcement Policy (Enforcement Policy) endorses progressive enforcement action for violations of waste discharge requirements when appropriate, but recommends formal enforcement as a first response to more significant violations. Progressive enforcement is an escalating series of actions that allows for the efficient and effective use of enforcement resources to: 1) assist cooperative dischargers in achieving compliance; 2) compel compliance for repeat violations and recalcitrant violators; and 3) provide a disincentive for noncompliance. Progressive enforcement actions may begin with informal enforcement actions such as a verbal, written, or electronic communication between the Central Valley Water Board and a discharger. The purpose of an informal enforcement action is to quickly bring the violation to the discharger's attention and to give the discharger an opportunity to return to compliance as soon as possible. The highest level of informal enforcement is a Notice of Violation.

### GENERAL FINDINGS

- 41 This Order does not authorize violation of any federal, state, or local law or regulation.
- 42 This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any action authorized under this Order, the Dischargers shall obtain authorization for an incidental take prior to construction or operation of the project. The Dischargers shall be responsible for meeting all requirements of the applicable Endangered Species Act.
- 43 This Order does not supersede the Central Valley Water Board's Basin Plans and policies, including prohibitions (e.g., pesticides) and implementation plans (e.g., Total Maximum Daily Loads), or the State Water Board's plans and policies.
- 44 As stated in California Water Code section 13263(g), the discharge of waste into waters of the state is a privilege, not a right, and regulatory coverage under this Order does not create a vested right to continue the discharge of waste. Failure to prevent conditions that create or threaten to create pollution or nuisance will be sufficient reason to modify, revoke, or enforce this Order, as well as prohibit further discharge.
- 45 This Order requires the Dischargers to provide the Central Valley Water Board with contact information of the person(s) authorized to provide access to property for inspections. This requirement provides a procedure to enable board staff to contact representatives so that it may more efficiently monitor compliance with the provisions of this Order.
- 46 Any instance of noncompliance with this Order constitutes a violation of the California Water Code and its regulations. Such noncompliance is grounds for enforcement action, and/or termination of coverage for waste discharges under this Order, subjecting the discharger to enforcement under the Water Code for further discharges of waste to surface water.
- 47 All discharges from the Grasslands Bypass Project are expected to comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges to storm drain systems or to other courses under their jurisdiction.

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- 48 The fact that it would have been necessary to halt or reduce the discharge in order to maintain compliance with this Order shall not be a defense for violations of the Order by the Dischargers.
- 49 This Order is not a National Pollutant Discharge Elimination System Permit issued pursuant to the Federal Clean Water Act. Coverage under this Order does not exempt a facility from the Clean Water Act. Any facility required to obtain such a permit must notify the Central Valley Water Board.
- 50 Water Code section 13260(d)(1)(A) requires persons subject to waste discharge requirements to pay an annual fee established by the State Water Board.
- 51 The Findings of this Order, supplemental information and details in the attached Information Sheet (Attachment A), and the administrative record of the Central Valley Water Board relevant to the Grassland Bypass Project were considered in establishing these waste discharge requirements.
- 52 The Central Valley Water Board has notified interested agencies and persons of its intent to adopt this Order for discharges of waste from the Grassland Bypass Project, and has provided them with an opportunity for a public hearing and an opportunity to submit comments.
- 53 The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to this Order.
- 54 Any person affected by this action of the Central Valley Water Board may petition the State Water Board to review this action. The State Water Board must receive the petition within 30 days of the date on which the Central Valley Water Board adopted this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request.

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IT IS HEREBY ORDERED that Order No. 5-01-234 is rescinded and that pursuant to California Water Code sections 13260, 13263, and 13267 and in order to meet the provisions contained in Division 7 of the California Water Code and regulations and policies adopted there under; the San Luis and Delta-Mendota Water Authority and the U.S. Bureau of Reclamation, their agents, successors, and assigns shall comply with the following:

**I. Prohibitions**

1. The discharge of hazardous waste, as defined in California Water Code section 13173 and Title 23 CCR section 2521(a), respectively, is prohibited.
2. The discharge of agricultural subsurface drainage water to Salt Slough and the wetland water supply channels identified in Appendix 40 of the Basin Plan is prohibited unless water quality objectives for selenium are being met.
3. The discharge of agricultural subsurface drainage water to Mud Slough (north) is prohibited after 31 December 2019 unless water quality objectives for selenium are being met.
4. The discharge of selenium from agricultural subsurface drainage systems in the Grassland Watershed to the San Joaquin River is prohibited in amounts exceeding 8,000 lbs/year.
5. The discharge of agricultural subsurface drainage is immediately prohibited upon determination by the Board, following an opportunity for response, that mitigation, as outlined in the *Agreement*

for Continued Use of the San Luis Drain for the Period January 1, 2010 through December 31, 2019<sup>8</sup> between the United States Bureau of Reclamation and the San Luis & Delta-Mendota Water Authority has not been provided.

**II. Limits that apply to the Grassland Bypass Project**

**A. Effluent Limits (Drain Terminus)**

1. The rate of discharge at the terminus of the San Luis Drain shall not exceed 150 cfs.
2. The discharge of selenium from the San Luis Drain shall not exceed the monthly loads in the following table:

| Month <sup>1</sup> | Effluent limits (pounds of selenium) |                  |              |     |
|--------------------|--------------------------------------|------------------|--------------|-----|
|                    | Critical                             | Dry/Below Normal | Above Normal | Wet |
| January            | 151                                  | 319              | 398          | 211 |
| February           | 93                                   | 185              | 472          | 488 |
| March              | 92                                   | 184              | 472          | 488 |
| April              | 101                                  | 193              | 490          | 506 |
| May                | 105                                  | 197              | 497          | 512 |
| June               | 69                                   | 130              | 212          | 354 |
| July               | 70                                   | 131              | 214          | 356 |
| August             | 75                                   | 137              | 225          | 366 |
| September          | 57                                   | 235              | 264          | 332 |
| October            | 55                                   | 233              | 260          | 328 |
| November           | 55                                   | 233              | 260          | 328 |
| December           | 152                                  | 319              | 398          | 211 |

<sup>1</sup> The monthly load limits are based on the water year classification (as defined in Footnote 17 for Table 3 in the State Water Resource Control Board's *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, May 1995) for October through September applied to the following calendar year, January to December. For example, the October through December 2014 load limits are based on the water year classification for October 2013 through September 2014.

3. The discharge of selenium from the San Luis Drain shall not exceed the annual loads in the following table:

| Year | Annual Load Limits (pounds of selenium) |                  |              |       |
|------|-----------------------------------------|------------------|--------------|-------|
|      | Critical                                | Dry/Below Normal | Above Normal | Wet   |
| 2015 | 1,075                                   | 2,496            | 4,162        | 4,480 |
| 2016 | 844                                     | 1,947            | 3,234        | 3,510 |
| 2017 | 612                                     | 1,398            | 2,306        | 2,540 |
| 2018 | 300                                     | 600              | 900          | 1,200 |
| 2019 | 300                                     | 600              | 900          | 1,200 |

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<sup>8</sup> Agreement No. 10-WC-20-3975.

## **B. Discharge Specifications**

1. The discharge shall not cause a pollution or nuisance as defined by the California Water Code, section 13050.
2. The San Luis Drain will be operated to prevent the mobilization of drain sediments. A maximum flow rate of 1 foot per second will be used to prevent scouring and mobilization of drain sediments.
3. The San Luis Drain will be operated to minimize erosion in Mud Slough (north). An energy dissipating structure will be operated and maintained at the discharge point to Mud Sough (north) to dissipate the energy caused by the hydraulic drop. Erosion within the stream, including stream bottom and sides will be prevented and bank stabilization will be undertaken, if necessary.
4. Sediment in the San Luis Drain used to convey agricultural subsurface drainage shall not exceed hazardous waste levels for any constituent.

## **C. Receiving Water Limitations**

1. The discharge from the San Luis Drain shall not cause or contribute to the following in Mud Slough (north) or the San Joaquin River.
  - a. In surface water, an exceedance of applicable water quality objectives or a trend of degradation that may threaten applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.
  - b. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or objects in the water.
  - c. Oils, greases, waxes, floating material (liquids, solids, foams, and scums), or suspended materials to create a nuisance or adversely affect beneficial uses.
  - d. Aesthetically undesirable discoloration.
  - e. Fungi, slimes, or other objectionable growths.
  - f. Deposition of material that causes nuisance or adversely affects beneficial uses.
  - g. Toxic pollutants to be present in the water column, sediments or biota in concentrations that adversely affect beneficial uses; that produce detrimental physiological response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
  - h. Chemical constituents, including pesticides, to be present in concentrations that cause nuisance or adversely affect beneficial uses.

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## **III. Provisions**

### **A. General Specifications**

1. The Dischargers subject to this Order shall implement water quality management practices as necessary, to protect water quality and to achieve compliance with applicable water quality objectives.
2. The provisions of this Order are severable. If any provision of the Order is held invalid, the remainder of the Order shall not be affected.

## B. Requirements

1. The Dischargers shall comply with all applicable provisions of the California Water Code, the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, and applicable State Water Board plans and policies.
2. The Dischargers shall comply with the attached Monitoring and Reporting Program (MRP) R5-2014-XXXX, and any future revisions thereto made by the board or Executive Officer.
3. The Dischargers shall follow the 1997 Grassland Bypass Project Storm Event Plan and any amendments thereto approved by the Executive Officer.
4. The requirements prescribed in this Order do not authorize the commission of any act causing injury to the property of another, or protect the Dischargers from liabilities under other federal, state, county, or local laws. This Order does not convey any property rights or exclusive privileges.
5. This Order shall not create a vested right, and all such discharges of waste shall be considered a privilege, as provided for in Water Code section 13263.
6. The Dischargers understand that the Central Valley Water Board or its authorized representatives, may, at reasonable hours, inspect the facilities and lands of persons subject to this Order to ascertain whether the purposes of the Porter-Cologne Act are being met and whether the Dischargers are complying with the conditions of this Order. To the extent required by Water Code section 13267(c) or other applicable law, the inspection shall be made with the consent of the Dischargers or authorized representative, or if consent is withheld, with a duly issued warrant pursuant to the procedure set forth in Title 13 Code of Civil Procedure Part 3 (commencing with section 1822.50). In the event of an emergency affecting the public health and safety, an inspection may be performed without the consent or the issuance of a warrant.
7. The Dischargers shall properly operate and maintain in good working order any facility, unit, system, or monitoring device installed to achieve compliance with the Order.
8. The Dischargers shall maintain a copy of this Order at the primary place of business so as to be available at all times to operations personnel. The Dischargers shall be familiar with the content of this Order.

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## IV. Permit Reopening, Revision, Transfer, Revocation, Termination, and Reissuance

1. This Order may be reopened to address any changes in state statutes, regulations, plans, or policies that would affect the water quality requirements for the discharges, including, but not limited to, the Central Valley Water Board *Water Quality Control Plan* (Basin Plan) *for the Sacramento River and San Joaquin River Basins*.
2. The filing of a request for modification, revocation and re-issuance, or termination of the Order, or notification of planned changes or anticipated noncompliance, does not stay any condition of the Order.
3. The Dischargers, shall provide to the Executive Officer any information which the Executive Officer may request to determine whether cause exists for modifying, revoking and re-issuing, or terminating the Order, or to determine compliance with the requirements of this Order.

4. The Central Valley Water Board will review this Order periodically and may revise this Order when necessary.
5. In the event of any change in control or ownership of the Grasslands Bypass Project, the Dischargers must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.
6. To assume operation as Dischargers under this Order, the succeeding owners or operators must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph in section VI.3 of this Order and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. The Executive Officer will submit transfer requests to the Central Valley Water Board so that the Board may consider transferring the ownership of this Order at one of its regularly scheduled meetings.

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## V. Required Reports and Notices

Reports and notices shall be submitted in accordance with section III, Reporting Provisions, as well as MRP Order R5-2014-XXXX. The Dischargers must prepare and maintain the following reports as instructed below, and shall submit or make available such reports to the Central Valley Water Board as identified below.

### A. Semi-annual Submittals of Surface Water Monitoring Results

The Discharger shall submit the previous quarter's surface water monitoring results in accordance with the requirements in section III of the MRP.

### B. Annual Monitoring Report (AMR)

The Dischargers shall submit the Annual Monitoring Report to the Central Valley Water Board in accordance with the requirements in section III of the MRP.

### C. Drainage Management Plan (DMP)

The Discharger shall submit the Drainage Management Plan to the Central Valley Water Board in accordance with the requirements in Section III of the MRP.

### D. Technical Reports

Where monitoring required by this Order is not effective in allowing the board to determine the effects of discharge on state waters or the effectiveness of water quality management practices being implemented, the Executive Officer may require technical reports be provided to determine the effects of operations or implemented management practices on surface water.

### E. Total Maximum Daily Load (TMDL) Requirements

Approved TMDLs in the Basin Plan that apply to surface water bodies downstream of the San Luis Drain discharge and have allocations for irrigated agriculture shall be implemented in accordance with the applicable Basin Plan provisions. Where applicable, SQMPs shall be developed or the Drainage Management Plan shall be updated to address TMDL requirements.

TMDL requirements include, but are not limited to, Basin Plan provisions for the Control Program for Salt and Boron Discharges into the Lower San Joaquin River. To meet the requirements of the Control Program for Salt and Boron Discharges into the Lower San Joaquin River, the Discharger must, by 30 June 2014, 1) participate in a Central Valley Water Board approved real-time management program<sup>9</sup>; or 2) submit a surface water quality management plan that includes the required elements identified in the Monitoring and Reporting Program, Appendix MRP-1 and is designed to meet the Base Salt Load Allocations identified in Table IV-4.4 *Summary of Allocations and Credits*<sup>10</sup> within the applicable compliance schedule for compliance in Table IV-4.3.<sup>11</sup>

#### F. Exceedance Report

The Discharger shall provide exceedance reports if limits identified in section II are not met. Exceedance reports shall be submitted in accordance with the requirements described in section III.C of the MRP.

#### G. Surface Water Quality Management Plan (SQMP)

A SQMP shall be developed by the Discharger where: (1) an applicable water quality objective or applicable water quality trigger limit is exceeded (considering applicable averaging periods<sup>12</sup>) twice in a three year period for the same constituent at a monitoring location (trigger limits are described in section IV of the MRP) and discharge from the Grassland Bypass Project may cause or contribute to the exceedances; (2) the Basin Plan requires development of a surface water quality management plan for a constituent or constituents discharged by irrigated agriculture, or (3) the Executive Officer determines that the Grassland Bypass Project may be causing or contributing to a trend of degradation of surface water that may threaten applicable Basin Plan beneficial uses. A SQMP is not required if the constituent of concern is addressed by a Drainage Management Plan.

A SQMP submitted by the Discharger shall conform to the requirements provided in MRP, Appendix MRP-1.

The Discharger shall ensure continued implementation of SQMPs until approved as completed by the Executive Officer pursuant to the provisions contained in the attached MRP, Appendix MRP-1, section III. The Discharger shall submit a progress report in compliance with the provisions contained in the attached MRP, Appendix MRP-1, section I.F.

### VI. Reporting Provisions

1. The Dischargers must submit required reports and notices in accordance with the requirements in this Order and attached Monitoring and Reporting Program Order R5-2014-XXXX, unless otherwise requested by the Executive Officer.

<sup>9</sup> Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, page IV-32.01

<sup>10</sup> *Ibid.*, page IV-32.04

<sup>11</sup> *Ibid.*, page IV-32.03

<sup>12</sup> Exceedances of water quality objectives or water quality triggers will be determined based on available data and application of the appropriate averaging period. The averaging period is typically defined in in the Basin Plan, as part of the water quality standard established by the USEPA, or as part of the criteria being used to interpret narrative objectives. If averaging periods are not defined in the Basin Plan, USEPA standard, or criteria, or approved water quality trigger, the Central Valley Water Board will use the best available information to determine an appropriate averaging period.

2. All reports shall be accompanied by a cover letter containing the certification specified in section VI.3. below. The cover letter shall be signed by a person duly authorized under California law to bind the party submitting the report.
3. Each person signing a report required by this Order or other information requested by the Central Valley Water Board shall make the following certification:

*"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment for violations."*

4. All reports prepared and submitted to the Executive Officer in accordance with the terms of this Order will be made available for public inspection at the offices of the Central Valley Water Board, except for reports, or portions of such reports, subject to an exemption from public disclosure in accordance with California law and regulations, including the Public Records Act, Water Code section 13267(b)(2), and the California Food and Agriculture Code. If the Dischargers assert that all or a portion of a report is subject to an exemption from public disclosure, it must clearly indicate on the cover of the report that it asserts that all or a portion of the report is exempt from public disclosure. The complete report must be submitted with those portions that are asserted to be exempt in redacted form, along with separately-bound unredacted pages (to be maintained separately by staff). The Dischargers shall identify the basis for the exemption. If the Executive Officer cannot identify a reasonable basis for treating the information as exempt from disclosure, the Executive Officer will notify the Dischargers that the information will be placed in the public file unless the Central Valley Water Board receives, within 10 calendar days, a satisfactory explanation supporting the claimed exemption. Data on waste discharges, water quality, meteorology, geology, and hydrogeology shall not be considered confidential.
5. To the extent feasible, all reports submitted by the Dischargers shall be submitted electronically to [irrlands@waterboards.ca.gov](mailto:irrlands@waterboards.ca.gov). and to the Central Valley Water Board-assigned staff liaison. Upon notification by the Central Valley Water Board, all reports shall be submitted directly into an online reporting system, to the extent feasible.

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## **VII. Record-keeping Requirements**

The Dischargers shall maintain any reports or records required by this Order for five years. The maintained reports or records, including electronic information, shall be made available to the Central Valley Water Board upon written request of the Executive Officer. This includes all monitoring information, calibration and maintenance records of sampling equipment, copies of reports required by this Order, and records of all data used to complete the reports. Records shall be maintained for a minimum of five years from the date of sample, measurement, report, or application. This five-year period shall be extended during the course of any unresolved litigation regarding the discharge or when requested in writing by the Executive Officer.

**VIII. Annual Fees**

1. Water Code section 13260(d)(1)(A) requires persons subject to waste discharge requirements to pay an annual fee established by the State Water Resources Control Board (State Water Board).
2. The Dischargers shall pay an annual fee to the State Water Board in compliance with the Waste Discharge Requirement fee schedule set forth at 23 CCR section 2200 that is applicable to Agricultural and Irrigated Lands.

This Order becomes effective on --date-- and remains in effect unless rescinded or revised by the Central Valley Water Board.

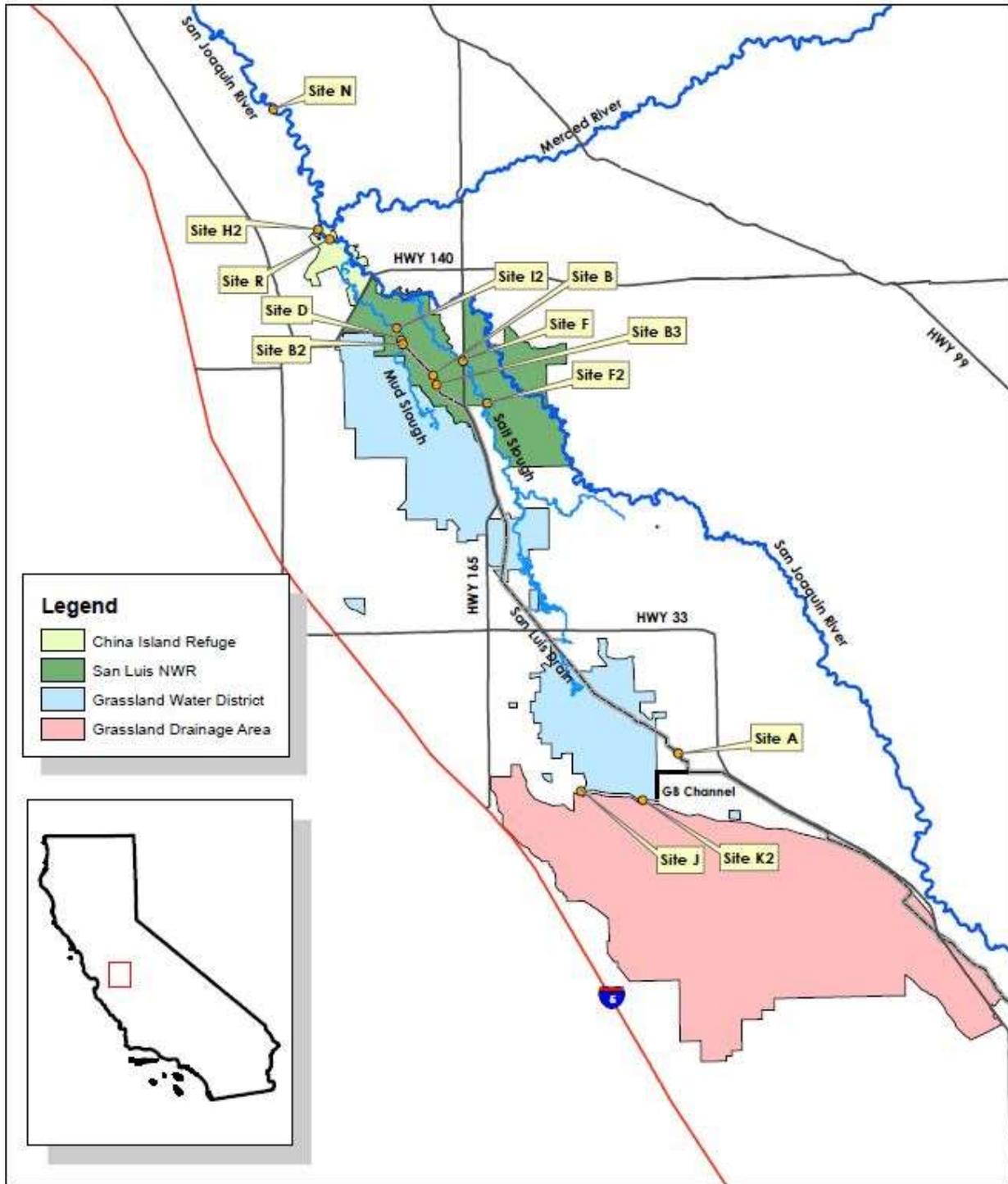
I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on --date--.

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PAMELA C. CREEDON, Executive Office

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Date

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Figure 1: Map of Grassland Bypass Project

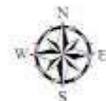


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### Grasslands Bypass Project

2013 Monitoring Plan Sites

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Grasslands Bypass Project  
NAD 1983 California Zone 10  
U.S. Bureau of Reclamation

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2014-XXXX  
ATTACHMENT 1.

DESCRIPTION OF LANDS SERVED BY THE GRASSLAND BYPASS PROJECT

1. Lands within Broadview Water District, the Firebaugh Canal Water District, the Pacheco Water District, the Panoche Drainage District, the Charleston Drainage District and the Widren Water District.<sup>13</sup>  
Containing 84,470 acres, more or less.
2. All of those portions of Section 26, 27, 34 ,35 and 36 in T. 11 S., R. 11 E., M.D.B.&M., Sections 31, 32, 33 and 34 in T. 11 S., R. 12 E., M.D.B.&M., Section 1 in T. 12 S., R. 11 E., M.D.B.&M., and Sections 2, 3, 4, 5, 6, 9, 10, 11 and 12 in T. 12 S., R. 12 E., M.D.B.&M., bounded on the north by the south right-of-way line of the Central California Irrigation District Main Canal, bounded on the east by the boundary of the Central California Irrigation District, bounded on the south by the north right-of-way line of the Central California Irrigation District Outside Canal, and bounded on the west by the Central California District Camp 13 Bypass Canal.  
Containing 5,380 acres, more or less.
3. All of those portions of Section 13, T. 12 S, R. 12 E. M.D.B.&M., and Sections 7, 17, 18 and 19, T. 12 S., R. 13 E., M.D.B.&M., bounded partially on the north and west by the Panoche Drainage District, bounded partially on the west, south and east by the Firebaugh Canal Water District and the Widren Water District, and bounded partially on the north by the southerly right-of-way of the Central California Irrigation District Outside Canal.  
Containing 1,410 acres, more or less.
4. All of those portions of Sections 1 and 12, T. 12 S., R. 12 E., M.D.B.&M., Sections 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17 and 24 T. 12 S., R. 13 E., M.D.B.&M., and Sections 19, 29, 30, 32, and 33, T. 12 S., R. 14 E., M.D.B.&M., being lands within the Central California Irrigation District bounded on the north and east by the south right-of-way line of the Central California Irrigation District Main Canal, bounded on the south and west by the north right-of-way line of the Central California irrigation District Outside Canal, bounded on the west by the boundary line of the Central California Irrigation District and bounded on the east by the Southern Pacific Railroad right-of-way line. These lands also known as the Camp 13 Drainage District.  
Containing 5,490 acres, more or less.
5. All of those portions of Sections 3 and 4, T. 12 S., R. 11 E. and Section 34, T. 11 S., R.11 E, M.D.B.&M., lying southerly of the Central California Irrigation District Outside Canal, bounded on the west by the Pacheco Lift Canal, bounded on the south by the Delta Mendota Canal, and bounded on the east by the east line of said Section 3.  
Containing 676 acres, more or less.
6. The west half of Sections 27 and 34, T. 11 S., R. 12 E., M.D.B.&M., lying southerly of the San Luis Drain and northerly of the Central California Irrigation District Main Canal, and the east half of Sections 28 and 33 T. 11 S., R. 12 E., M.D.B.&M., also lying southerly of the San Luis Drain and northerly of the Central California Irrigation District Main Canal.  
Containing 1,100 acres, more or less.
7. Lands adjacent to right-of-ways that may be acquired in the future necessary for drainage facilities to serve the Drainage Area.

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<sup>13</sup> Broadview Water District and Widren Water District no longer irrigate with surface water and do not contribute drainage to the Grassland Bypass Project. The lands served by these two districts are still within the project area.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION**

**ATTACHMENT A TO ORDER R5-2014-XXXX  
INFORMATION SHEET**

**WASTE DISCHARGE REQUIREMENTS GENERAL ORDER  
FOR**

**SAN LUIS & DELTA-MENDOTA WATER AUTHORITY  
AND  
United STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION**

**SURFACE WATER DISCHARGES FROM THE  
GRASSLAND BYPASS PROJECT**

**FRESNO AND MERCED COUNTIES**

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## I. Overview

This attachment to Waste Discharge Requirements for Surface Water Discharges from the Grassland Bypass Project, Order R5-201X-XXXX (referred to as the “Order”) is intended to provide information regarding the rationale for the Order, general information on surface monitoring that has been conducted, and a discussion of this Order’s elements that meet required state policy.

## II. Introduction

The Grassland Bypass Project (GBP) addresses the transport of subsurface drainage, as well as stormwater runoff, from a portion of the agricultural lands in the western portion of the San Joaquin River (SJR) Basin. Soils on the west side of the SJR Basin are of marine origin and are high in selenium and salts. Major land uses in the watershed include agriculture and managed wetlands. Irrigation is necessary for nearly all crops grown commercially in the watershed. Supplied irrigation water applied without adequate drainage causes the shallow or perched water table to rise, leading to waterlogging and evapoconcentration of salts and trace elements in the crop root zone. Adding irrigation water to dissolve and leach these salts and trace elements into the shallow groundwater is necessary to maintain the salt balance in the crop root zone. Drainage tiles and associated sumps are used to lower the water table. The subsurface drainage from this area typically contains high concentrations of dissolved solids, selenium and boron.

The Grassland watershed is a valley floor sub-basin of the San Joaquin River Basin, covering an area of approximately 370,000 acres. The Grassland Drainage Area (GDA), about 97,400 acres, is located within the Grassland watershed, roughly between Los Banos to the north and Mendota to the south (Figure 1). The GDA is the primary source of selenium in the watershed area. The GBP routes subsurface drainage and surface runoff from the GDA to a portion of the San Luis Drain, then to Mud Slough (north), a point about six miles upstream of the San Joaquin River confluence. The Grasslands Bypass Project effectively allows agricultural drainage water to “bypass” wetland supply channels, thereby, avoiding the discharge of high levels of selenium to managed wetlands, where waterfowl could be impacted.

Phase I of the GBP went into operation in 1996 and Waste Discharge Requirements (WDRs) were first issued in 1998. Updated WDRs for Phase II of the GBP were adopted in 2001. Since then the board has adopted general waste discharge requirements under the Irrigated Lands Regulatory Program (ILRP), which include provisions related to surface water discharges from irrigated lands. This update of the Order incorporates changes to the Basin Plan, modifications to the GBP (Phase III) and elements of other ILRP WDRs.

There are differences between this Order and the general WDRs issued by the ILRP for the rest of the Central Valley. While the ILRP general orders address both surface water and groundwater, this order specifically addresses surface water discharges. Discharges to groundwater from the area served by the GBP will be regulated in the future through a separate order or orders.

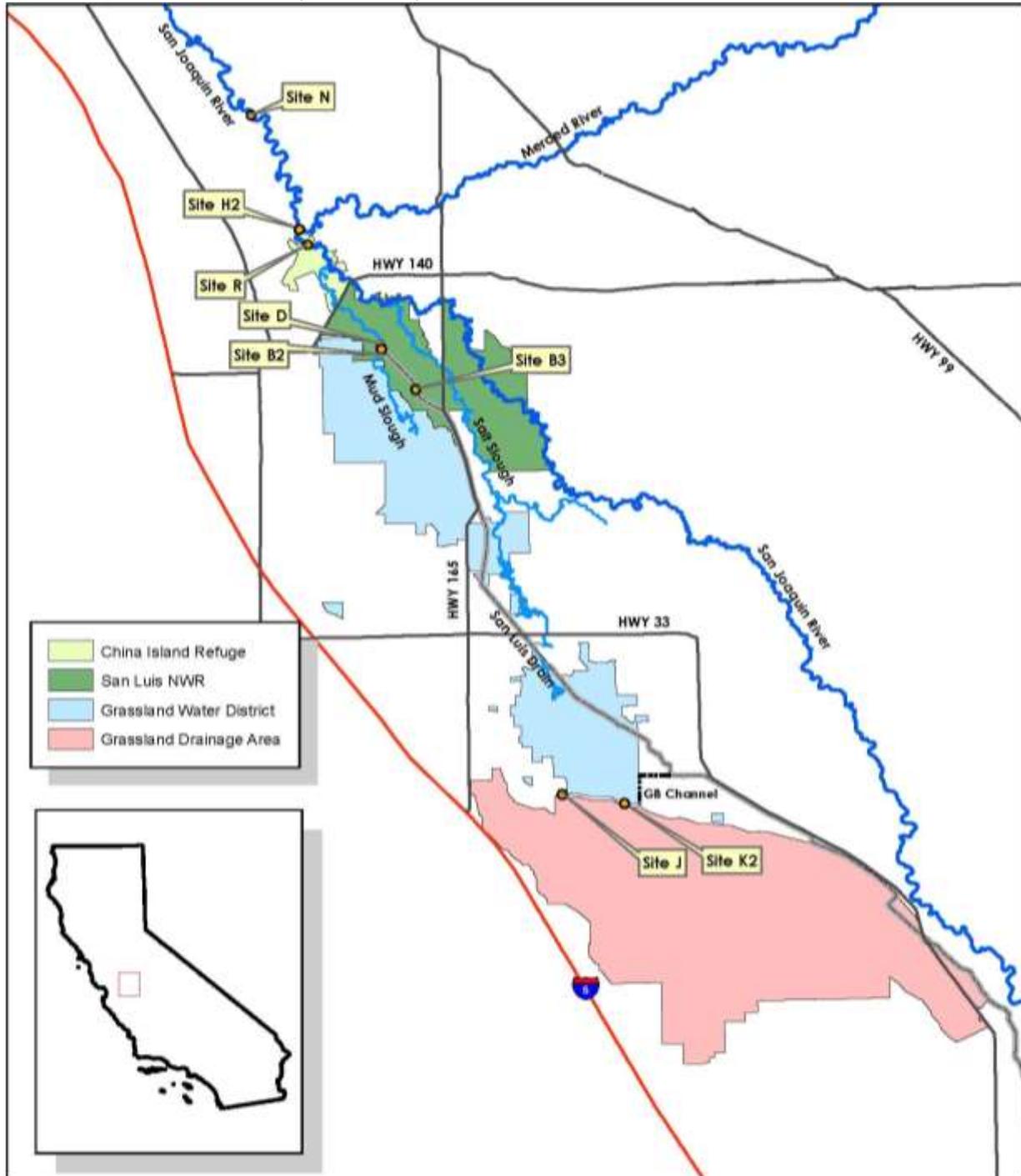
The GBP WDRs are issued to the U.S. Bureau of Reclamation, owner of the San Luis Drain (Drain), and to the San Luis & Delta-Mendota Water Authority that represents member districts within the GDA. Members of the San Luis & Delta-Mendota Water Authority, a Joint Power Authority, operate the GBP.

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### III. Description of the Grassland Bypass Project

Seven contiguous member districts<sup>1</sup> of the San Luis & Delta-Mendota Authority (Authority) are within the GDA. These districts supply or transport irrigation water and/or subsurface drainage to the Grassland Area Farmers (GAF) in the GDA. Figure 2 is a map of the GBP and GAF member locations.

Figure 1: Map of Grassland Bypass Project



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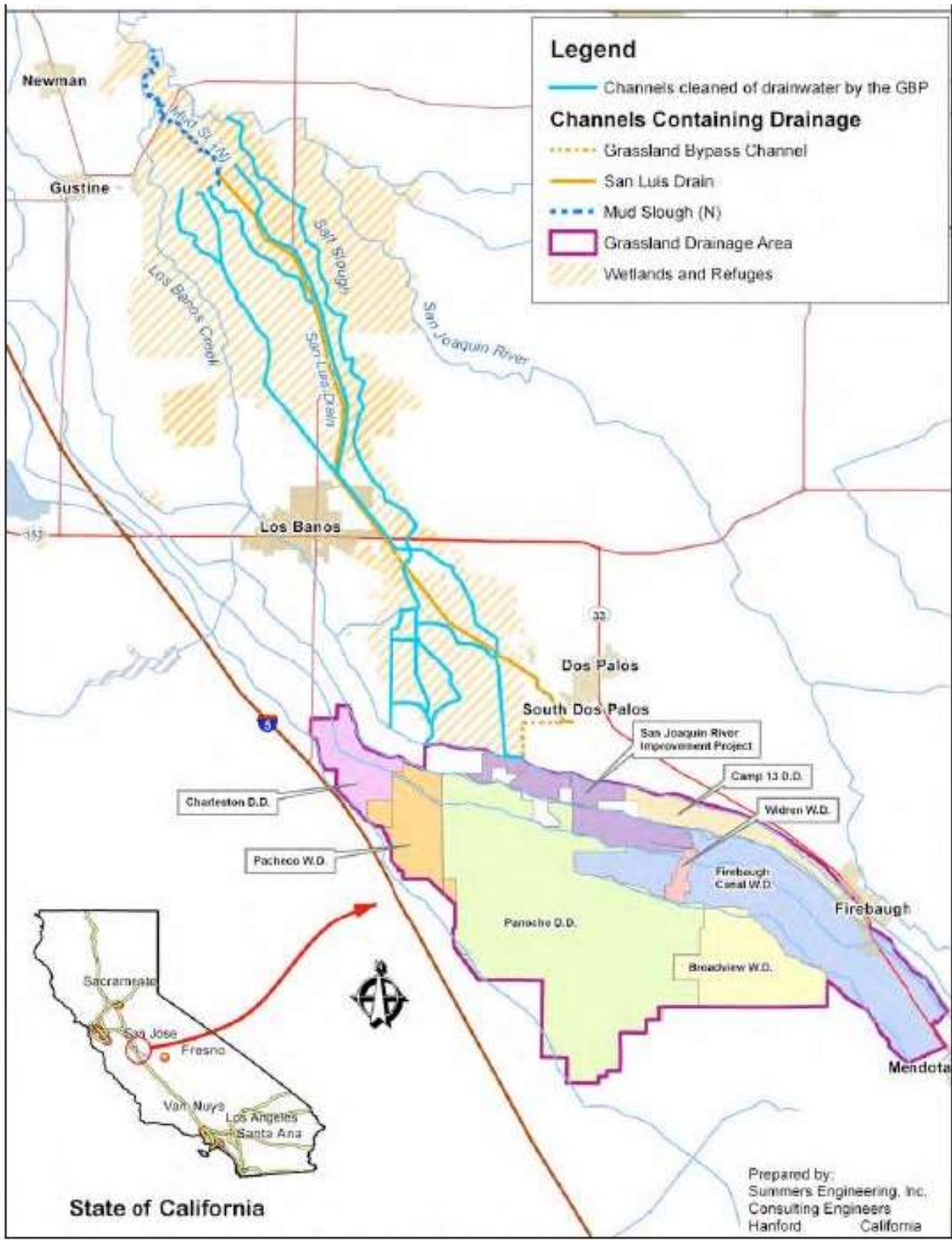
**Grassland Bypass Project**  
2014 Monitoring and Reporting Plan Sites

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Miles



Grassland Bypass Project  
NAD 1983 California Zone 10  
U.S. Bureau of Reclamation

**Figure 2: Map of Grassland Bypass Project and Grassland Area Farmers**  
(from Grassland Bypass Project Annual Report 2008-2009)



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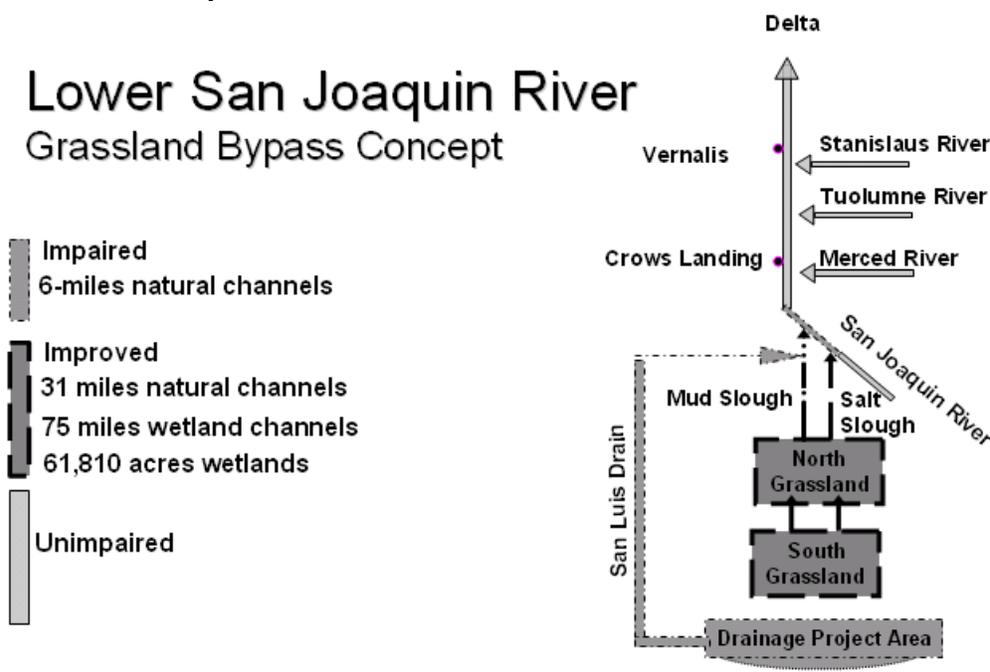
Subsurface agricultural drainage from approximately 38,700 acres in the Grassland Drainage Area is routed to the Drain through the Grassland Bypass Channel. From there, it travels 28 miles to the Drain's terminus and discharges to Mud Slough (north). During most of the year, the discharge primarily consists of subsurface agricultural drainage that is high in salts, selenium, boron, and other constituents. The GBP is also designed to handle local stormwater runoff. The Drain has been blocked above the Grassland Bypass Channel at Check 19 to prevent the introduction of other flows.

The GBP discharges the subsurface drainage to Mud Slough (north) at a point six miles upstream of the San Joaquin River confluence. Historically, this subsurface agricultural drainage reached the San Joaquin River via Mud Slough (north) or Salt Slough, but was routed through various channels in the Grassland Water District (GWD). These channels were also used to supply water to wetlands within the GWD. The dual use of the channels as both drainage and supply canals limited the ability to provide good quality water to the wetlands. The GBP removes the GDA subsurface agricultural drainage and routes it around the wetland areas using several ditches and a portion of the Drain. Figure 3 shows the conceptual model for the GBP.

When the GBP began, it was known that a 6-mile portion of Mud Slough would be impaired for a time in exchange for permanent improvement of the water supply channels serving wetlands. The GBP temporarily allows drainage to exit the basin, progressively decreasing loads of selenium while management practices to control selenium and adequate in-basin drainage management facilities were developed. The performance goals and time schedules to achieve the selenium water quality objectives for the San Joaquin River were incorporated as part of the Basin Plan. This Order allows for the implementation of further practices and treatment to meet the water quality objectives stated in the Basin Plan.

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**Figure 3: GBP Conceptual Model**



During major storm events, general surface runoff and stormwater flows may exceed the capacity of the Grassland Bypass Channel. It is not possible during these major events to separate agricultural drainage from surface runoff and stormwater flows. During these major events, all of the commingled surface runoff, storm water flows and agricultural drainage may be diverted temporarily to the Grassland Water District channels, ditches and sloughs that carried drainage water and stormwater runoff to the San Joaquin River prior to the GBP implementation. The procedures and monitoring required for such an

event are outlined in “A Storm Event Plan for Operating the Grassland Bypass Project”<sup>2</sup> and in revised Monitoring and Reporting Program Order WDR 5-01-234<sup>3</sup>, and further detailed in section IV.9 of the MRP Order.

#### IV. History of the Grassland Bypass Project

##### Phase I

The original GBP proposal had a maximum of 5-years for use of a portion of the Drain to convey subsurface drainage through the GWD and adjacent area. The original GBP was implemented through an “Agreement for Use of the San Luis Drain”<sup>4</sup> between the Bureau and the Authority for the period of 1 October 1996 to 30 September 2001 (Water Years<sup>5</sup> 1997 to 2001). A Finding of No Significant Impact was adopted by the Bureau for the original project.

In 1996 the Central Valley Regional Water Quality Control Board (Central Valley Water Board) amended the *Water Quality Control Plan, Third Edition, for the Sacramento and San Joaquin River* (Basin Plan) to address selenium in the San Joaquin River, Salt Slough, and Mud Slough. The amendment indicated that WDRs would be used to regulate discharges and included time schedules, performance goals and water quality objectives. The control actions were designed to achieve the following in the order of priority:

1. Separate subsurface agricultural drainage containing high levels of selenium from sensitive wildlife areas.
2. Obtain compliance with selenium water quality objectives in the San Joaquin River downstream of the Merced River confluence.
3. Obtain compliance with the selenium objectives in Mud Slough downstream of the San Luis Drain outfall and in the San Joaquin River from its confluence with Mud Slough to the confluence with the Merced River.

The first goal was achieved through the implementation of the GBP and is reinforced by a prohibition of discharge in the WDRs for the project. The second goal has been achieved through selenium load reduction measures implemented by the Grasslands Area Farmers – Salt Slough and the stretch of the San Joaquin River downstream of the Merced is no longer listed as impaired by selenium. The third goal has not yet been achieved. However, this Order and the Basin Plan requires that the third goal be met by 2019.

The Central Valley Water Board issued WDR 98-171 on 24 July 1998 for Phase I of the GBP. The WDRs established selenium discharge load values (pounds of selenium monthly and annually) that resulted in a 15 percent reduction from the average historical load to the San Joaquin River by the 5<sup>th</sup> year. Additional reductions in the selenium load were required to continue improvements to the San Joaquin River water quality and meet selenium requirements in the 1998 Basin Plan.

WDR 98-171 also required an annual update of the long-term Drainage Management Plan (LTDMP) that would include a summary of achievements of the water quality objectives in the Basin Plan and set in the WDR. Any plans and activities for long-term drainage management by the Grassland Area Farmers to meet the water quality objectives were discussed and goals were established. Any developments impacting the efforts of the Grassland Area Farmers were also discussed.

<sup>2</sup> The Storm Event Plan was approved on 25 August 1997 by GAF and the Authority.

<sup>3</sup> The process for the storm event notifications was incorporated in the revised MRP approved on 7 September 2001.

<sup>4</sup> Agreement No. 6-07-20-21319

<sup>5</sup> A water year is defined as a 12 month time period from 1 October of one year to 30 September of the next. The water year is designated by the calendar year in which it ends (the year within which 9 of the 12 months fall).

### Phase II

A new Use Agreement<sup>6</sup> between the Bureau and Authority was completed on 28 September 2001 following the completion of a Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR)<sup>7</sup>. Phase II covers a period from 1 October 2001 to 31 December 2009. During this period, the GBP was regulated by WDR Order 5-01-234 issued on 7 September 2001. The Monitoring and Reporting Program (MRP) attached to the Order required monitoring for general parameters<sup>8</sup>, selenium, boron, molybdenum, nitrates and aquatic toxicity testing at specific sites with set schedule and frequency. Stormwater monitoring was required during storm events when the GBP may not be able to accommodate all surface runoff, stormwater flows, and agricultural drainage water. The stormwater monitoring was required to determine the effect of GDA discharge diversion to Grassland and wetlands channels. The Order also included continued reporting of the LTDMP on an annual basis.

Selenium loads limits<sup>9</sup> were established for discharge to the San Joaquin River and waste discharge requirements were used to control discharges of subsurface agricultural drainage from the Grassland Drainage Area. The compliance timetable gave the Dischargers deadlines to meet the selenium objective in the San Joaquin River and various channels, including Salt Slough and Mud Slough (north).<sup>10</sup> There was also a prohibition of discharge effective 1 October 2010 for subsurface agricultural drainage discharges unless selenium water quality objectives were being met.

The GBP was in compliance with applicable objectives in most channels addressed in the Basin Plan, but was unable to fully manage all agricultural subsurface drainage to meet the water quality objective for Mud Slough (north) and the San Joaquin River above the Merced River confluence by the 1 October 2010 deadline. The GBP operators believed the project area would achieve full control of agricultural subsurface drainage if additional time beyond the set compliance date was granted to allow time to obtain funding and develop technology to reduce selenium loads.<sup>11</sup>

### Phase III

The Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for Phase III of the GBP was finalized August 2009.<sup>12</sup> A new Use Agreement for the continued use of the San Luis Drain was signed for the period of 1 January 2010 through 31 December 2019.<sup>13</sup> The Central Valley Water Board passed amendments to the Basin Plan<sup>14</sup> to: 1) extend the date for meeting the selenium objective in Mud Slough (north) and the San Joaquin River above the Merced River to 31 December 2019; and 2) revised the compliance time schedule located in chapter IV (implementation chapter) of the Basin Plan for

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<sup>6</sup> Agreement No. 01-WC-20-2075

<sup>7</sup> URS, 2001. *Grassland Bypass Project Environmental Impact Statement and Environmental Impact Report*. Final May 25, 2001. Prepared for U.S. Bureau of Reclamation, Sacramento and Fresno, CA. and San Luis & Delta-Mendota Water Authority, Los Banos, CA.

<sup>8</sup> General parameters included flow, pH, electrical conductivity and temperature.

<sup>9</sup> Load limits for selenium were based on water year classification established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification (as defined in Footnote 17 for Table 3 in the State Water Resources Control Board's *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, May 1995) at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series. The previous year's classification will apply until an estimate is made of the current water year.

<sup>10</sup> Salt Slough and the wetland channels had a deadline of 10 January 1997 to meet 2 µg/L selenium, monthly mean; Mud Slough (north) and the San Joaquin River from Sack Dam to the Merced River had a 1 October 2010 deadline to meet 5 µg/L (4-day average); and the San Joaquin River below the Merced River (above normal and wet water years) a deadline of 1 October 2005 at 5 µg/L (4-day average), with critical, dry and below normal water years a deadline of 1 October 2010 at 5 µg/L (4-day average).

<sup>11</sup> Stated in ES2 Project Purpose and Need of the EIS/EIR for Phase III. See next section for more information.

<sup>12</sup> Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report*. Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA.

<sup>13</sup> Agreement No. 10-WC-20-3975, finalized 17 December 2009.

<sup>14</sup> Resolution No. R5-2010-0046, Amending the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Selenium in the Lower San Joaquin River Basin, 27 May 2010.

Agricultural Drainage Discharges in the San Joaquin River Basin and its accompanying narrative description in Regional Board Prohibitions, section 6.c.

This Order implements the WDRs for Phase III of the GBP. New features in Phase III include in-valley treatment drainage reuse at the San Joaquin River Quality Improvement Project (SJRIP) facility; utilizing and installing drainage recycling system to mix subsurface drain water with irrigation supplies under strict limits; continuing current land retirement policies; an active land management program to utilize subsurface drainage on salt-tolerant crops; and a no-tailwater policy to prevent silt from being discharged into the Drain. Discussion of these elements is in section V.

The Use Agreement and WDRs specified load reductions for selenium and salinity with values expressed in annual and monthly load objectives. It should be noted that the selenium load values were designed to meet the total maximum daily limit (TMDL) for the San Joaquin River by 2015.<sup>15</sup> The GDA is the major contributor for selenium in the San Joaquin River Basin.<sup>16</sup> The WDR selenium performance goal is 15 µg/L (monthly mean) by 31 December 2015 in Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River. The selenium water quality objective for the same locations is 5 µg/L (4-day average) by 31 December 2019.

The Use Agreements between the Bureau and Authority also incorporated a performance incentive system in which GAF is assessed fees if selenium and/or salinity load reduction goals are not met. The fees are used for projects approved by the Oversight Committee. Fees are calculated by the Bureau of Reclamation for the attributable discharge for each year and month.

The 2009 Use Agreement provides “Incentive Fee Credits” when annual and monthly discharges are more than 10 percent below the respective load values specified in the tables for selenium and salinity. These incentive credits may be applied against future monthly or annual exceedances through December 2017. These “credits” apply to the Use Agreement between the Bureau and Authority, but are not part of this Order. Such credits could not be applied in a manner that would negate a violation of the limits in this Order.

The Use Agreements provides for project termination if annual selenium loads from the GBP exceed certain values. Figure 4 shows the annual selenium loads required by the water year type (critical, below normal, above normal and wet) with the corresponding values for termination of the project.<sup>17</sup> The graph shows a decrease in the annual selenium loads for each water year type until 2018 when the selenium loading will comply with the water quality objectives and TMDL requirements.

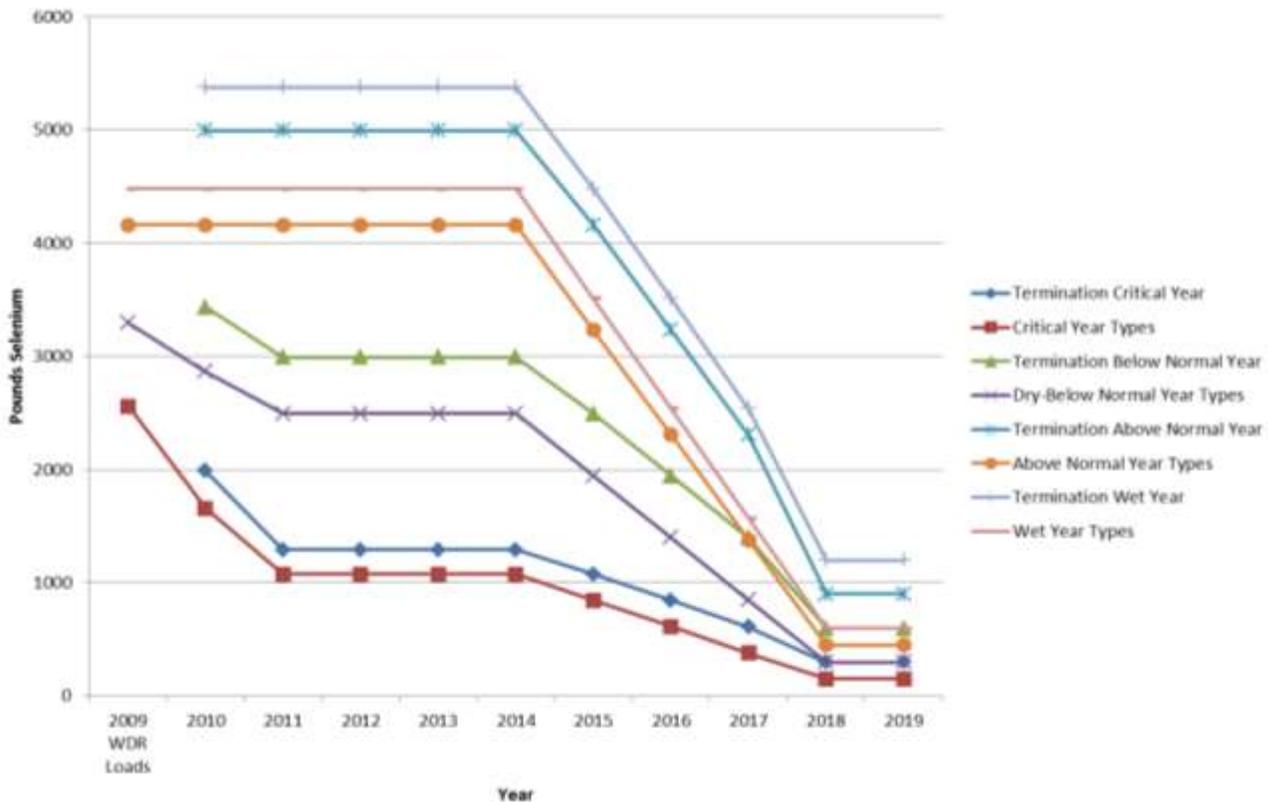
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<sup>15</sup> Selenium load limits have been met for the San Joaquin River below the confluence with the Merced River. The selenium objectives in Mud Slough (north) have not been met.

<sup>16</sup> Chilcott, J.E., 1988, *Water Quality of Tile Drainage Discharges in the San Joaquin River Basin*, Regional Water Quality Control Board, Central Valley Region, Staff Report. October, 1988.

<sup>17</sup> The Oversight Committee may overrule the termination if it finds, after consultation with other parties, the Authority has shown the exceedance was caused by unforeseeable and uncontrollable events.

**Figure 4: Annual Selenium Loads and Termination Loads by Water Year Type**



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**A. Project Management**

The Authority represents the collection of local drainage and water districts that operate the GBP. The Bureau and the Authority are the responsible parties for the GBP.

A number of participating organizations, besides the Bureau, Authority and Central Valley Water Board, are involved in the GBP data collection, monitoring, and reporting. These participants include:

- U.S. Environmental Protection Agency (USEPA)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Geological Survey (USGS)
- National Marine Fisheries Service (NMFS)
- California Department of Fish and Wildlife (CDFW)

To assist the Bureau and Authority, several committees and teams of private, State and Federal agencies are directly involved in aspects of the GBP by providing technical, advisory, and policy review and oversight. These include:

*Oversight Committee*

The Oversight Committee was created in Phase II and consists of representatives from the Bureau, USFWS, CDFW, USEPA and the Central Valley Water Board. The Oversight Committee role is to evaluate overall operations of the GBP, assess monetary charges to the Authority for selenium loads exceeding those specified in the Use Agreement, and to act on other issues brought to them by the Technical and Policy Review Team (TPRT) and/or the public.

*Technical and Policy Review Team (TPRT)*

The Technical Policy Review Team (TPRT) assists the Oversight Committee with technical issues. TPRT members include a representative the Bureau, the Central Valley Water Board, CDFW, NMFS, USFWS, and USEPA. A representative from the USGS serves as an independent technical advisor. Responsibilities of the TPRT include the review and analysis of analytical data and reports, and obtaining appropriate peer or scientific review as necessary.

*Data Collection and Reporting Team (DCRT)*

The Data Collection and Reporting Team (DCRT) members are agency representatives and contractors collecting, verifying, and reporting GBP data. The DCRT coordinates monitoring activities and address issues and concerns regarding data collection, data management, and quality assurance/quality control.

*Quality Control Officer*

A Bureau representative serves as the quality control officer, working with cooperating agencies to verify, validate, coordinate and update the quality control activities associated with the project.

**B. Surface Water Monitoring History**

Initial monitoring for the GBP started in 1995 and was performed by the Central Valley Water Board until 2011, when the Bureau assumed the duties. Monthly, quarterly, and annual reports are posted for all GBP monitoring on the San Francisco Estuary Institute (SFEI) website at <http://www.sfei.org/Project/reports>.

While selenium is the primary concern, the drainage also contains boron, molybdenum, high levels of salts and other constituents that can impact receiving waters. The Basin Plan contains numerical objectives for boron and molybdenum as well as narrative water quality objectives that apply to this water body. Table 1 shows the numerical objectives for selenium, boron and molybdenum for Mud Slough (north) and the San Joaquin River at various points.

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**Table 1: Selenium, Boron and Molybdenum Numerical Objectives**

| <b>Constituent</b> | <b>Monthly Mean</b>                                                                                | <b>Maximum</b>       | <b>Location</b>                                                                                 |
|--------------------|----------------------------------------------------------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------|
| <b>Selenium</b>    | 20 µg/L                                                                                            | 5 µg/L 4-day average | Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River |
|                    | 12 µg/L                                                                                            | 5 µg/L 4-day average | San Joaquin River, mouth of the Merced River to Vernalis                                        |
| <b>Boron</b>       | 0.8 mg/L (15 March-15 September)<br>1.0 mg/L (16 September - 14 March)<br>1.3 mg/L (Critical Year) | 2.0 mg/L<br>2.8 mg/L | San Joaquin River, mouth of the Merced River to Vernalis                                        |
| <b>Molybdenum</b>  | 19 µg/L                                                                                            | 50 µg/L              | Salt Slough, Mud Slough (north) and San Joaquin River from Sack Dam to mouth of Merced River    |
|                    | 10 µg/L                                                                                            | 15 µg/L              | San Joaquin River, mouth of Merced River to Vernalis                                            |

The lower San Joaquin River is 303(d) listed for salts. Effluent limits for salts are not in the waste discharge requirements for the GBP. The Basin Plan provisions for the *Control Program for Salt and Boron Discharges into the Lower San Joaquin River*<sup>18</sup> requires that the Dischargers must by 30 June 2014: 1) participate in a Central Valley Water Board approved real-time management program; or 2) submit a management plan that includes the elements identified in the Monitoring and Reporting Program Appendix MRP-1 and is designed to meet the Base Salt Load Allocations identified in

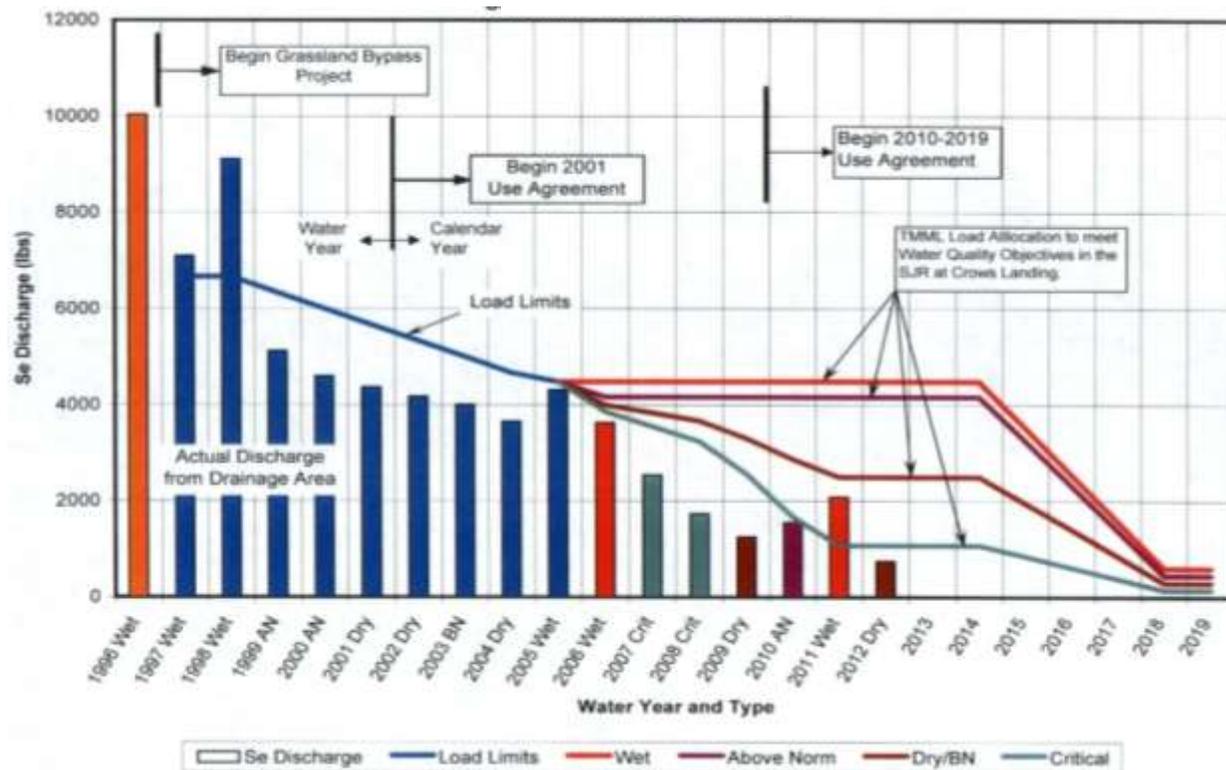
<sup>18</sup> Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, page IV-32.00

Table IV-4.4, *Summary of Allocations and Credits*,<sup>19</sup> within the applicable compliance schedule for compliance in Table IV-4.3.<sup>20</sup> A real-time monitoring program is being used to measure and report flow and electrical conductivity as part of the Use Agreement monitoring program. It is expected that the selenium reduction in waste discharges will also result in boron and salt reduction.

Previous monitoring sites targeted selenium concentrations from the GBP to determine compliance with selenium load limits set within the Use Agreements and the corresponding WDRs. Monthly load limits for selenium were also calculated based on the category of water year, historical monitoring data, the TMDL allocations, and required water quality objectives. Figure 5 shows the selenium discharged from the Grassland Drainage Area on an annual basis, with the limits set by the water year type.

**Figure 5: Grassland Drainage Area – Selenium Discharge and Targets**

From draft WY2010-WY2011 report (WY 2013 data has not been evaluated)



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Historically, monitoring has consistently occurred at four areas with at least one monitoring location: 1) the San Luis Drain; 2) Mud Slough (north); 3) the wetlands channels; and 4) the San Joaquin River. The monitoring program has included sampling upstream and downstream sites (shown in Table 2) to determine selenium loading from the GBP and possible other contributors to the total selenium load. Selenium monitoring has historically occurred at Mud Slough (north) upstream of the Drain (Station C) to determine wetlands contribution; Mud Slough (north) downstream of the Drain (Station D) to determine total discharge from the GBP and wetlands to the San Joaquin River; and the GBP contribution to the selenium load by sampling in the Drain before discharge to Mud Slough (Station B). San Joaquin River monitoring has occurred downstream of the Mud Slough discharge (Stations H and N) to determine the GBP's contribution to the river before and after confluence with the Merced River. Figure 6 is a schematic showing the location of these sites.

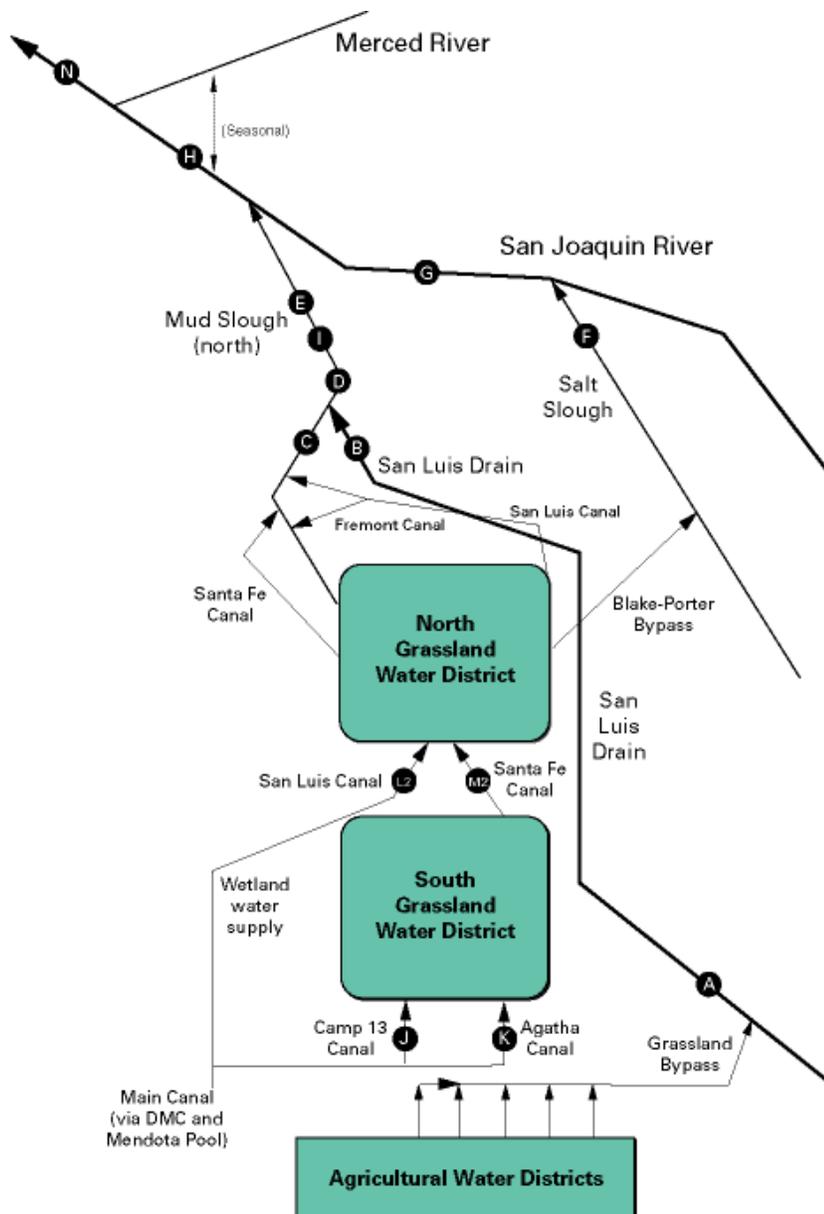
<sup>19</sup> *Ibid.*, page IV-32.04

<sup>20</sup> *Ibid.*, page IV-32.03

**Table 2: Historic Monitoring Sites in Phases I and II of the Project**

| Feature            | Station | Description                                                                                          |
|--------------------|---------|------------------------------------------------------------------------------------------------------|
| San Luis Drain     | B       | San Luis Drain, upstream of discharge to Mud Slough (north)                                          |
| Mud Slough (north) | C       | Mud Slough (north) upstream of the San Luis Drain discharge.                                         |
|                    | D       | Mud Slough (north) downstream of the San Luis Drain discharge                                        |
| San Joaquin River  | H       | San Joaquin River before confluence with Merced River                                                |
|                    | N       | San Joaquin River at Crows Landing; downstream of confluence with Merced River, upstream of Vernalis |

**Figure 6: Schematic of Past Monitoring Sites**



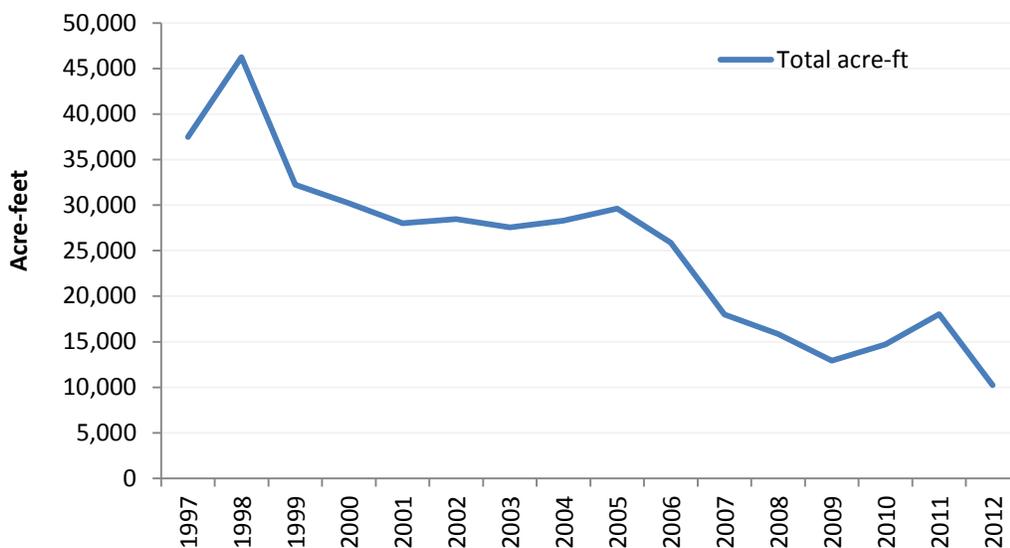
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Additional monitoring sites included areas within the Drain (Station A), in Salt Slough (Station F), in Mud Slough (north) (Stations E and F), and the San Joaquin River (Station G). These sites are still being monitored, but on a less frequent schedule or during major storm events. Salt Slough monitoring was reduced since the Basin Plan selenium water quality objective<sup>21</sup> was met in Phase II and the channel has been delisted for selenium.

**C. Past Monitoring Results**

Past monitoring results are summarized in this section for the following parameters that are of concern: selenium, boron, molybdenum, salts (as indicated by electrical conductivity measurements), and aquatic toxicity. Figure 7 shows that the discharge from the Grassland Drainage Area has decreased significantly<sup>22</sup> since GBP implementation. The decrease in flow is likely due to the combined result of water delivery infrastructure improvements, irrigation system modernization, and reuse activities for subsurface drainage.

**Figure 7: Total Flow from the Grassland Drainage Area, Years 1997 to 2012**



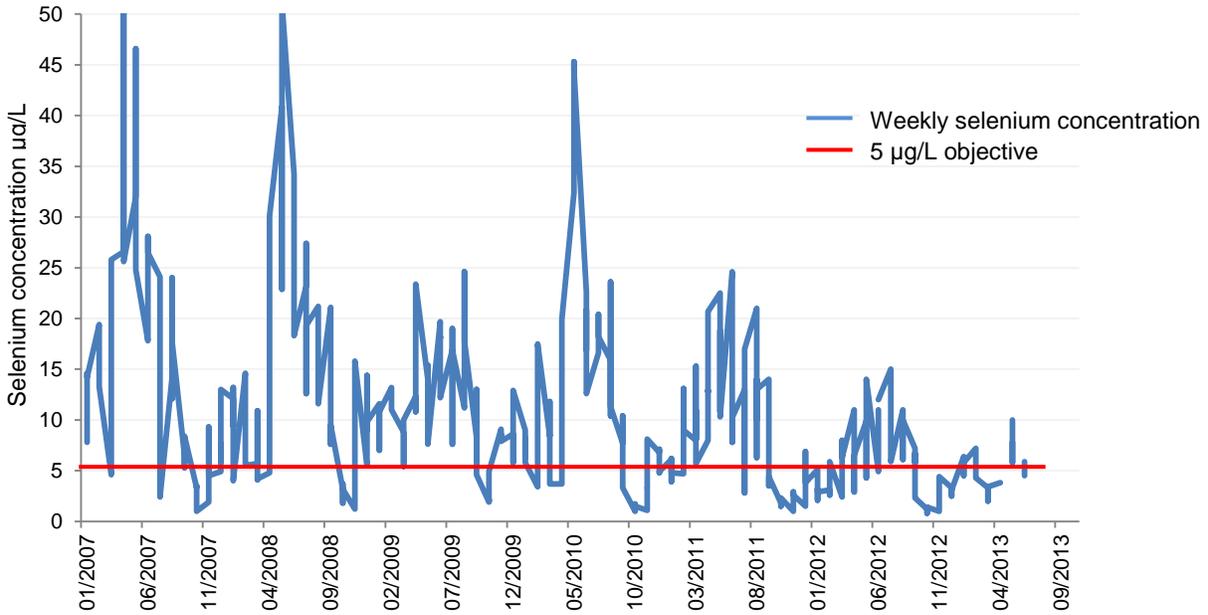
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**1. Selenium**

Figure 8 shows graphically the monthly average of selenium concentrations at Mud Slough (north) downstream of the Drain discharged from the GDA (Station D) from 2007 to 2013. The decrease in selenium concentration with the decrease in discharge volume from the GDA has decreased the selenium loading and moved the GAF along the “glidepath” identified in the Use Agreement. The selenium load has decreased approximately 80%<sup>23</sup> since the start of the program. Activities implemented to decrease the selenium loading include improved irrigation application, tiered water pricing, tailwater controls, seasonal land fallowing, and reuse and treatment involving recycling, and the use of subsurface drainage water on salt tolerant crops and to wet roadways for dust control.

<sup>21</sup> Water quality objective was 2 µg/L selenium (monthly mean) in Salt Slough and wetland water supply channels.  
<sup>22</sup> Drainage is down 72% when comparing total flow from CY 2012 with CY1997.  
<sup>23</sup> Percentage calculated based on average of selenium annual loads from 2008 to 2012 and the load in 1997. Values for 1997, 2008 to 2011 from Table 3c of Grassland Bypass Project Annual Report 2010-2011. 2012 selenium load value from letter dated 26 December 2013 from Joseph C. McGahan to Pamela C. Creedon, *Waste Discharge Requirement Order No. t-01-234, Update of Long Term Drainage Management Plan.*

**Figure 8: Selenium Concentration in Mud Slough below San Luis Drain 2007 to 2013**



2. Boron and Molybdenum

Figure 9 shows graphically the monthly average of boron concentrations in the San Joaquin River after the confluence with the Merced River (Station N) from 2007 to 2013. The boron concentration generally meets the water quality objective and it is anticipated further implementation of the San Joaquin River Improvement Project will further reduce the boron concentrations from the GBP.

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**Figure 9: Boron Concentration in San Joaquin River (Station N) 2007 to 2013**

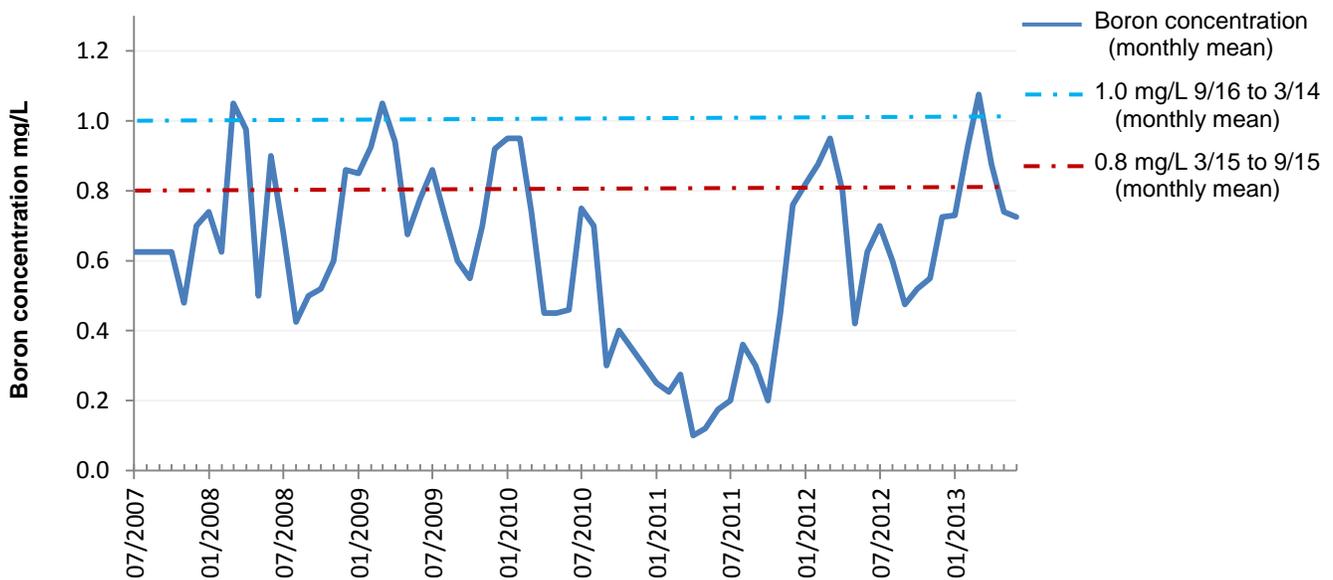
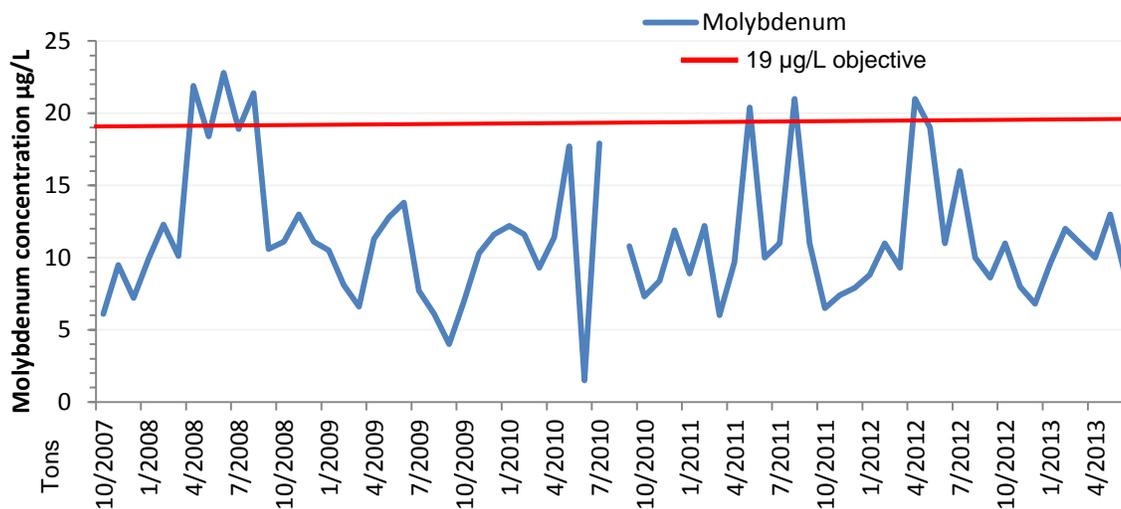


Figure 10 shows graphically the molybdenum concentrations observed in Mud Slough (Station D) from 2007 to 2013.<sup>24</sup> Molybdenum has been observed below the 50 µg/L maximum concentration.

**Figure 10: Molybdenum Concentration at Mud Slough below San Luis Drain**

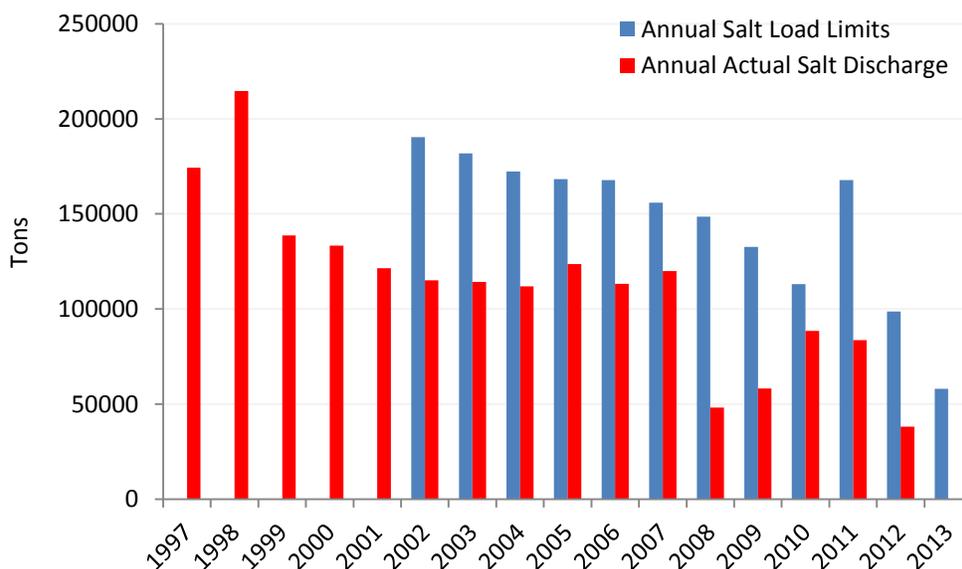


3. Salts

Salt loads are part of the Use Agreements and are calculated using electrical conductivity and flow. Salt or salinity load limits are part of the Use Agreements and based on water year category. Figure 11 shows the salt load limits based on the methodology in the 2001 Use Agreement with selenium loads as the driving management constraint.

In addition, the Basin Plan has a control program for salt and boron discharges from the Lower San Joaquin River. Both the U.S. Bureau of Reclamation and the San Luis & Delta-Mendota Authority are participating in the Central Valley Water Board CV-SALTS program.

**Figure 11: Annual Loads of Salt Discharged from the Grassland Drainage Area Compared to Salt Load Limits**



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<sup>24</sup> Water Year 2012 data ends in December 2011.

## V. Implemented Actions and Management Practices

The ultimate goal of the Grassland Bypass Project is to eliminate all agricultural subsurface drainage to the San Joaquin River, a zero discharge to the river. To accomplish this goal, the Grassland Area Farmers (GAF) and the Dischargers have worked to implement management practices and actions to lower the selenium load discharged to the San Joaquin River. This section lists some of the management practices and actions that have been implemented or are planned for implementation:

### A. Conservation Efforts

Conservation efforts were initiated by GAF and by the water district to reduce the volume of subsurface drainage to the GBP. These efforts include the following:

1. Improved irrigation management  
Growers have implemented management practices that limit pre-irrigation use and over-watering. Installation of drip or micro-irrigation, combined with improved water management, lowers water use and increases irrigation efficiency. Shorter water runs are encouraged. Improved irrigation efficiency results in less water going past the crop root zone and, thereby, raising the water table, which generates the subsurface drainage.  
  
The member districts of the GDA have or had programs that encourage growers to improve their irrigation practices. Several of the districts have provided low interest loans to growers for improved irrigation equipment.
2. Initiation of tiered water pricing  
The member districts of the GDA have implemented a tiered water price structure that encourages the conservation of water and efficient use of any delivered irrigation water. Higher prices per acre-foot of water delivered are charged if growers go above a certain amount.
3. Installation of tailwater controls  
Growers are required to separate tailwater from subsurface drainage. Discharge of tailwater is prohibited from the GDA to the Grassland Bypass Channel. A number of GDA growers have installed tailwater return systems or use irrigation methods that do not generate surface runoff.
4. Reduced drainage seepage  
Infrastructure improvements, such as lining canals and installing piping, have reduced drain seepage through the transport system. Reducing drainage seepage to groundwater helps keep groundwater levels lower, and, thereby, reduces the amount of subsurface drainage water produced.

### B. Reuse and recycling

The GAF and water districts have implemented the following efforts to reduce the subsurface drainage from entering waters of the state.

1. Recirculation of subsurface drainage by participating districts  
The participating water and irrigation districts in the GDA have constructed facilities to recirculate drain water back into their irrigation distribution system. Recycling drainage water reduces the amount of water that would otherwise need to be imported or pumped and reduces the net amount of subsurface drainage that needs to be discharged out of the area.
2. Prohibition of tailwater discharge into water district canals  
To encourage conservation and recycling, water districts do not allow the discharge of tailwaters into their canals within the GDA.
3. Use of subsurface drain waters on roads  
Subsurface drainage has been reused to wet roads for dust control.

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### **C. Fallowing of land**

Approximately 10,400 acres in the GDA have been permanently fallowed, including lands served by the Broadview Water district and Widren Water District. These retired lands are no longer irrigated with supplied water, which reduces the impacts of deep percolation from these areas.

### **D. San Joaquin River Improvement Project**

The San Joaquin River Improvement Project (SJRIP) is a series of projects to aid the GAF with lowering the selenium loading from the GBP. Subsurface drainage from the surrounding area is channeled to the SJRIP area. Projects in progress or being proposed include the following:

- Reuse of subsurface drainage water: Started in 2002, this project included the construction of distribution facilities and the planting of salt tolerant crops on agricultural land. The planted acreage has increased from the original 1,821 acres to more than 5,200 acres, which have been irrigated with drainage water or blended water (subsurface drainage and “fresh” irrigation water). In 2013, approximately 26,000 acre-feet of drain water was reused to irrigate the crops that include producing pistachio trees and salt-tolerant grasses.
- Future phases of the SJRIP project involve the development of additional acreage, installation of more subsurface drainage systems, and implementation of treatment and salt disposal components.
- Another SJRIP project involves a contaminant monitoring program for bird eggs. This biological monitoring started in 2002 and has examined the levels of selenium in a small sample of bird eggs each year. In line with this project, the GAF, Bureau and Authority have tried to discourage birds from inhabiting or nesting in the SJRIP. The program involves hazing birds during the nesting season, diligent water management, and modification of drains to discourage avian use.

### **E. Demonstration Treatment Facility**

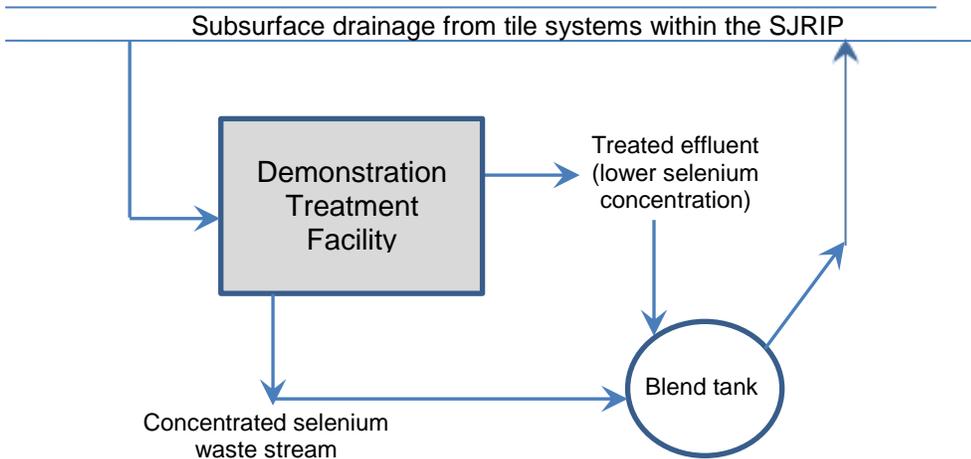
Although not part of the SJRIP, but complementary to the GBP, is the Panoche Drainage District Demonstration Treatment Facility. The facility is located on a portion of the SJRIP reuse area and will test various treatment projects to reduce selenium and salinity loads from the GAF. Projects being considered are:

- Water FX Solar Distillation Demonstration Project: use of a parabolic solar collector to heat and distill the subsurface drain water, then condensing the evaporate which should be “clean” water. A concentrated brine solution is produced as the other byproduct. Phase I of the pilot project has been completed. The contractor proposes to expand the project to increase capacity and install thermal storage to allow operation through the night.
- UCLA Smart Membrane Pilot Test: project will test an optical membrane monitoring device on a reverse osmosis pilot treatment system. Assembly of the system is in progress.
- HDR Deep Well Injection Study: The project reviewed existing information on deep aquifer formations to estimate the potential for deep well injection of subsurface drainage as a management tool.
- USBR RO Demonstration Project: The project will construct a demonstration-scale reverse osmosis treatment plant and a selenium removal component.

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The Demonstration Treatment Facility is operated by the Bureau and the Panoche Drainage District to intercept drainage from the existing subsurface agricultural drain systems in the SJRIP area, run the drainage water through various treatment processes to evaluate the efficacy for salt and selenium removal, blend the output from each of the treatment systems, and then recycle the blended mixture back into the SJRIP drainage system (see schematic shown as Figure 12). The selenium loading will not change with operation of the Demonstration Treatment Facility since both the treated effluent and the higher selenium byproduct will be blended prior to being discharged back into the SJRIP subsurface drainage system.

**Figure 12: Schematic of Demonstration Treatment Facility**



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The different treatment options will be evaluated and assessed for efficiency and effectiveness in removing selenium and salts from the subsurface drainage waters. The ultimate goal of the GAF is a “zero discharge” from the GDA by the end of 2019.

#### **F. Removal of sediment from the San Luis Drain**

Selenium is listed as a hazardous waste at high concentrations under the USEPA 40 CFR 261.24.<sup>25</sup> Sediments in the San Luis Drain (SLD) may contain selenium. These sediments, if transported along the Drain, would transport the selenium that may then migrate back into the water column. If selenium migration from the sediment to water column occurs, this selenium would be included in the total annual load discharged by the GAF. If sediment acts as a sink (or repository) for the selenium, then the selenium concentration may reach the value where it may be considered “hazardous” waste.

The 2010 Use Agreement limits the maximum rate of flow in the Drain to be 150 cfs in order to avoid re-suspending sediment that may contain selenium. If monitoring results indicate the Drain behaves like a sink, the total selenium load in the sediment can be calculated and the information used to determine if the concentrations are close to hazardous waste values. Sediments would be removed before composite concentrations reach those values.

#### **VI. Monitoring in Phase III**

The Basin Plan amendments allow discharges from the GBP area to continue to exceed selenium objectives at Mud Slough (north) and the San Joaquin River between the Mud Slough discharge and the confluence with the Merced River. Load limits for selenium set forth in this Order and the required monitoring will determine if progress is being made to reach compliance with water quality objectives.

<sup>25</sup> USEPA defines materials with a selenium concentration of 1 ppm (or mg/kg), if no longer useful and “discarded”, to be “hazardous waste” and must be disposed in accordance with regulations.

Table 3 shows the compliance time schedule for meeting the selenium water quality objective and performance goal as specified in the Basin Plan.

**Table 3: Selenium Compliance Time Schedule**

(The performance goal is in italics; the water quality objective is in bold.)

| Water Body                                                                                      | 31 December 2015                | 31 December 2019                |
|-------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Mud Slough (north) and the San Joaquin River from the Mud Slough Confluence to the Merced River | <i>15 µg/L<br/>monthly mean</i> | <b>5 µg/L<br/>4-day average</b> |

Total maximum monthly loads (TMMLs) for selenium have been established based on the water quality objective which will apply no later than 31 December 2019 (Table 4.)

**Table 4: Selenium Monthly Load Allocations for the Grassland Drainage Area<sup>26</sup>**  
 (pounds of selenium)

| Month     | Effluent Limits which apply no later than<br>31 December 2019 |                     |                 |      |
|-----------|---------------------------------------------------------------|---------------------|-----------------|------|
|           | Critical                                                      | Dry/Below<br>Normal | Above<br>Normal | Wet  |
| October   | 55                                                            | 233                 | 260             | 328  |
| November  | 55                                                            | 233                 | 260             | 328  |
| December  | 152                                                           | 319                 | 398             | 211  |
| January   | 151                                                           | 319                 | 398             | 211  |
| February  | 93                                                            | 185                 | 472             | 488  |
| March     | 92                                                            | 184                 | 472             | 488  |
| April     | 101                                                           | 193                 | 490             | 506  |
| May       | 105                                                           | 197                 | 497             | 512  |
| June      | 69                                                            | 130                 | 212             | 354  |
| July      | 70                                                            | 131                 | 214             | 356  |
| August    | 75                                                            | 137                 | 225             | 366  |
| September | 57                                                            | 235                 | 264             | 332  |
| Total     | 1075                                                          | 2496                | 4162            | 4480 |

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Past monitoring has shown boron and salt loads have decreased as selenium loads have decreased. It is expected that this correlation will continue.

**A. Monitoring in Phase III**

The monitoring sites and parameters analyzed in this MRP Order are used to evaluate compliance with the objectives and limitations in the Basin Plan. Additional monitoring at other locations and for other constituents are specified in the Use Agreement, but not required by this MRP Order.

GBP's Phase III monitoring sites relevant to this Order are shown in Table 5. Monitoring sites from the previous MRP Order were changed due to safety concerns, operational changes, and monitoring costs. Monitoring at Salt Slough was dropped since the selenium water quality objective was met. These changes include: 1) continuous monitoring of flow, electrical conductivity and temperature at certain stations due to installation of transmitting pressure transducers; 2) replacement of Station H2 with Station

<sup>26</sup> The effluent limits in Table 4 are based on the calculated load allocation need to meet the water quality objectives the San Joaquin River at Crows Landing. The monthly load allocation is based on the water year classification applied to the following calendar year. For example, the October through December 2014 load limits are based on the water year classification for October 2013 through September 2014.

R as a monitoring site in the San Joaquin River; 3) replacement of Station B2 with Station B3 in the San Luis Drain; and 4) removing monitoring from the wetland channels except during storm events. A map of these sites is shown in Figure 13.

**Table 5: Phase III Monitoring Stations**

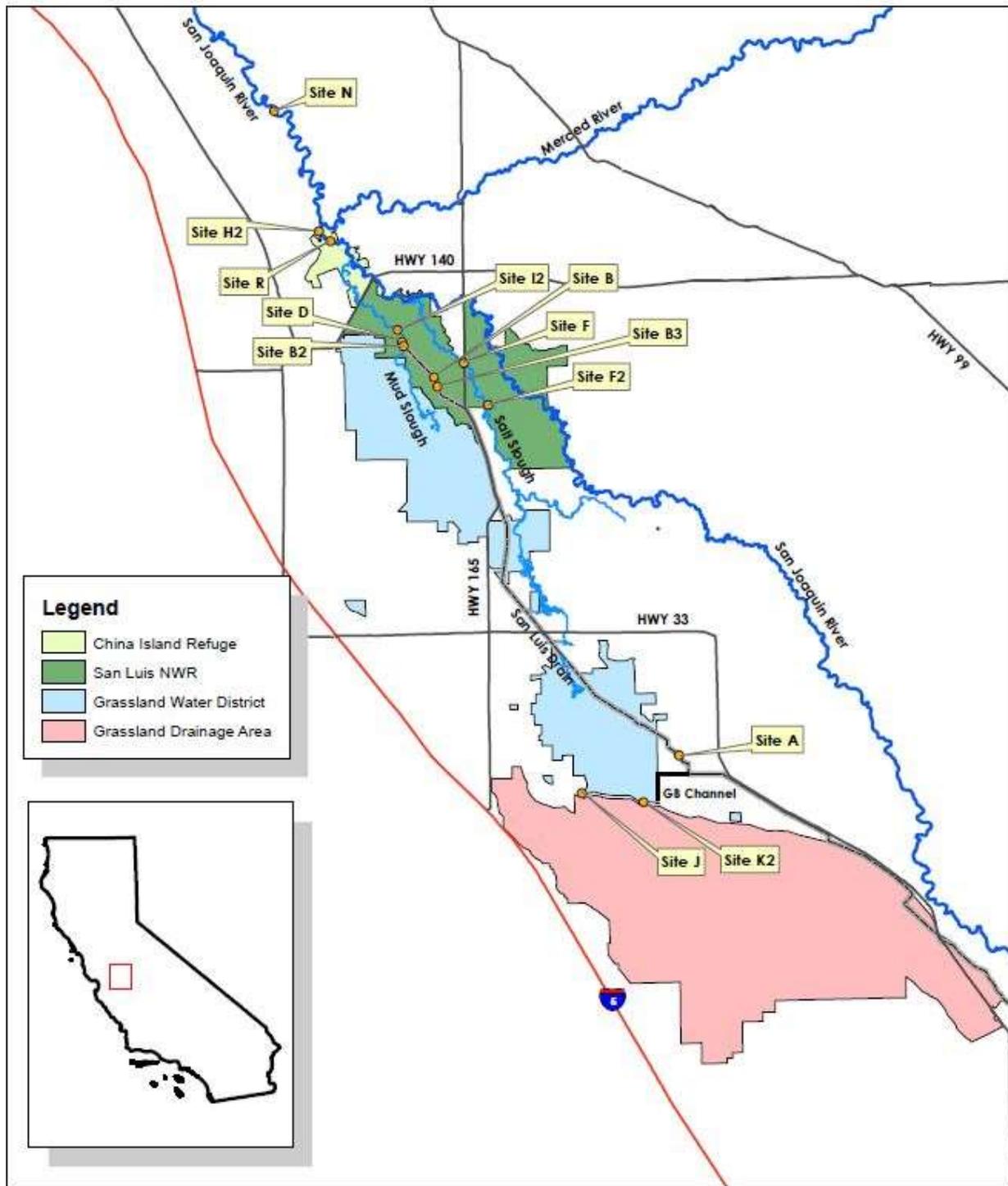
| Feature                   | Station | Location                       | Latitude   | Longitude    |
|---------------------------|---------|--------------------------------|------------|--------------|
| <b>San Luis Drain</b>     | B2**    | Terminus at Mud Slough         | 37.26100 N | -120.90520 W |
|                           | B3      | Gun Club Road                  | 37.23159 N | -120.87599 W |
| <b>Mud Slough (north)</b> | D       | Downstream of SLD discharge    | 37.26374 N | -120.90627 W |
| <b>Wetlands channels</b>  | J*      | Camp 13 Drain, headworks       | 36.94117 N | -120.75685 W |
|                           | K*      | Agatha Canal, headworks        | 36.93399 N | -120.70258 W |
| <b>San Joaquin River</b>  | R       | China Island Unit              | 37.33622 N | -120.96763 W |
|                           | H2**    | Hills Ferry above Merced River | 27.34737 N | -120.97500 W |
|                           | N       | Crows Landing                  | 37.43149 N | -121.01341 W |

\* Samples will be collected when water is passing site during a storm event.

\*\* Flow monitoring at station only; no monitoring required by MRP.

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Figure 13: Monitoring Stations for Phase III

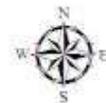


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### Grasslands Bypass Project

2013 Monitoring Plan Sites

0 2.5 5 10 Miles



Grasslands Bypass Project  
RAD 1983 California Zone 10  
U.S. Bureau of Reclamation

Figure is from *Grassland Bypass Project 2013 Revised Monitoring Program*, 26 March 2013

## B. Surface Water Monitoring Requirements in Phase III<sup>27</sup>

Table 2 of the MRP Order summarizes the monitoring stations, parameters and frequency for sampling required by the WDR during Phase III. At Stations B2 and H2 only flow will be monitored.

Monitoring will be performed by the entities with responsibilities and authority in the Grassland Drainage Area as specified in WDR Order R5-2014-XXXX. The Dischargers are required to submit an Annual Monitoring Report by 31 March of each year that will cover the monitoring period from the previous calendar year (1 January through 31 December). The following parameters will be monitored.

### 1. Flow

Flow is a basic parameter in the measurement of contaminant loads in the Grassland Basin. Flow in the San Luis Drain must be managed to prevent sediment erosion. For all sites, flow measurements are daily averaged based on continuous measurements, or the flow observed passing over weir boards or across a staff gauge.

### 2. Selenium

The monitoring program for Phase III requires weekly monitoring of selenium (total) at Stations B3, D, R, and N. Additional sampling will occur in the wetlands channels and Mud Slough (north) if flow is passing through during a storm event.

### 3. Boron and Molybdenum

Boron is to be measured on a weekly basis at Stations D, R, and N to determine compliance with the numeric objectives in the Basin Plan for the San Joaquin River. Sampling at Stations D and R will be used to determine if discharge from Mud Slough (north) after the confluence with the San Luis Drain or other sources in the San Joaquin River may be contributing to any boron exceedances further downstream

Molybdenum is sampled monthly at Stations B3, D, R, and N to determine compliance with numeric objectives in the Basin Plan for Mud Slough (north), San Joaquin River downstream of the confluence with the Merced River, and the San Joaquin River after the Merced River confluence. Monitoring at Station B3 will determine the contribution from the GDA to Mud Slough (north).

### 4. Salts

Electrical conductivity, taken on a daily average, can be used as an indicator of salts. Continuous real-time monitoring for electrical conductivity and flow are taken at Stations D, H2 and N. Flow measurements are measured by pressure transducers at these sites. Weekly sampling at Stations B3 and R will be required by the MRP and will include electrical conductivity as part of the field measurements.

### 5. Nutrients

Nutrients monitoring include nitrates as Nitrogen (N) and total ammonia as N. Previous monitoring data from 2000 to 2013 at Station D indicate total phosphorus as P is less than 0.5 mg/L. Nitrate as N during that same period showed 21 events (weekly sampling) with concentrations above the 10 mg/L level, but only 1 event since 2008. Monitoring occurs monthly at Stations B3 and D.

### 6. Pesticides

Pesticides will be monitored biannually with the pesticides analyzed based on evaluation by the Discharger and the Regional Board of pesticide use data for the GDA. Sampling timing will be dependent on use periods and will occur at Stations B3, D and R. The entire Central Valley currently has Total Maximum Daily Loads (TMDLs) for diazinon, chlorpyrifos, and organochlorine pesticides, and Regional Board staff is developing a general pesticide TMDL for the Central Valley.

### 7. Aquatic Toxicity

Aquatic toxicity monitoring is used to evaluate compliance with the Basin Plan narrative toxicity water quality objective. The toxicity monitoring is monthly for all species. Samples are to be collected from

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<sup>27</sup> DCRT. Grassland Bypass Project 2013 Revised Monitoring Program dated 26 March 2013.

Station D. Toxicity testing will involve three species: *Magna dubia*, *Pimpehales promelas*, and *Selenastrum capricornutum*. Acute toxicity testing (4-day test) will be used for *M. dubia* and *P. promelas*, with results reported on survival compared to a lab control.<sup>28</sup> Chronic toxicity testing (7-day) shall be performed with *S. capricornutum* with the results reported based on growth compared to the lab control.<sup>29</sup>

#### 8. Sediment Toxicity

Sediment toxicity is used to evaluate compliance with the Basin Plan narrative toxicity water quality objective and narrative settleable material objective. The sediment toxicity test is a 10-day test with *Hyalella azteca* with reporting based on survival compared to a lab control.<sup>30</sup> Sediment testing for total organic carbon and grain size will be concurrent with the *H. azteca* toxicity testing since these factors have been found to influence sediment toxicity results.

#### 9. Sediment Monitoring

Sediment testing is required annually for Station B3 with the analyses to be determined.

Additional testing, not required by the MRP, will occur at various locations in the San Luis Drain for sediment depth and cross-sectional area, selenium, total organic carbon and percent moisture. These values will be used to determine the sediment volume in the drain, and changes in quantity and movement of sediment in the Drain. The chemical analyses will be used as a comparison with Department of Health Services and USFWS selenium criteria for hazardous waste and ecological risk, respectively.

### C. Stormwater Monitoring

Storm and flood event monitoring will be required when flows are expected to exceed the capacity of the San Luis Drain as a result of major rainfall events. Actions to be taken are specified in the MRP and Storm Event Plan.<sup>31</sup>

## VII. Technical Reports

The surface water quality monitoring under the Order is regional in nature, since the GBP addresses drainage discharges at a regional level and responsibility for those discharges is assumed by entities with responsibility and authority in the Grassland Drainage Area. A benefit of regional monitoring is the ability to determine whether water bodies accepting discharges from the Grassland Drainage Area are meeting discharge and receiving water limitations. Regional monitoring allows the Central Valley Water Board to determine, at the regional level, whether implemented operations and actions are protective of water quality. There are limitations to regional monitoring when trying to determine possible sources of water quality problems.

Therefore, through the Surface Water Quality Management Plans, the Dischargers must evaluate the effectiveness of its operations in meeting discharge and receiving water limitations. Through the evaluations and studies conducted by the Dischargers, and the board's compliance and enforcement activities, the board will be able to determine whether is the Dischargers are complying with the Order.

This Order requires the Dischargers to provide technical reports. These reports may include special studies at the direction of the Executive Officer. The Executive Officer may require special studies where

<sup>28</sup> USEPA, 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. USEPA-821-R-02-012. Test methods 20021.0 and 2000.0 for *D. magna* and *P. promelas*, respectively.

<sup>29</sup> USEPA, 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organism, Fourth Edition. USEPA-821-R-02-013. Test method 1003.0.

<sup>30</sup> USEPA, 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. Test method 100.1.

<sup>31</sup> Grassland Area Farmers and San Luis & Delta-Mendota Water Authority. "A Storm Event Plan for Operating the Grassland Bypass Project". August 25, 1997.

the required monitoring is ineffective in determining potential sources of water quality problems. Special studies help ensure that the potential information gaps may be filled through targeted technical reports.

### VIII. Reports and Plans

Central Valley Water Board staff will post all plans and reports required for approval by the Executive Officer on the board's website upon approval.

### IX. Water Quality Objectives

Surface water limitations in section II of the Order specify that waste discharge may not cause or contribute to an exceedance of discharge or receiving water limitations, or cause a trend in degradation that may threaten applicable beneficial uses, or cause a condition of pollution or nuisance.

Water quality objectives that apply to surface water are described in the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan). Applicable water quality objectives include, but are not limited to, (1) the numeric objectives, including the bacteria objective, the chemical constituents objective (includes listed chemicals and state drinking water standards, i.e., maximum contaminant levels (MCLs) promulgated in Title 22 California Code of Regulations (CCR) Division 4, Chapter 15 sections 64431, 64444 and 6449 that are applicable through the Basin Plan to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, the salinity objectives, and the turbidity objectives; and (2) the narrative objectives, including the biostimulatory substances objective, the chemical constituents objective, and the toxicity objective. The Basin Plan also contains numeric water quality objectives that apply to specifically identified water bodies, such as the areas in the Grassland Bypass Project. The Basin Plan includes performance goals and discharge and receiving water limitations for the Grassland area. Federal water quality criteria that apply to surface water are contained in federal regulations referred to as the California Toxics Rule and the National Toxics Rule. See 40 CFR sections 131.36 and 131.38.

The requirements that waste discharge not unreasonably affect beneficial uses or cause a condition of pollution or nuisance are prescribed pursuant to sections 13263 and 13241 of the California Water Code. Section 13263 of the California Water Code requires Regional Water Boards, when establishing waste discharge requirements, to consider the need to prevent nuisance and the provisions in section 13241 of the California Water Code. Section 13241 requires Regional Water Boards to consider several factors when establishing water quality objectives including prevention of nuisance and reasonable protection of beneficial uses.

#### A. Implementation of Water Quality Objectives

The Basin Plan includes numeric and narrative water quality objectives. The narrative toxicity objective states: *"All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."* The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituent objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, *"...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)"* in Title 22 of the California Code of Regulations (CCR). The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs. The narrative tastes and odors objective states: *"Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses."*

The Sacramento-San Joaquin Basin Plan at page IV-16.00, contains an implementation policy, "Policy for Application of Water Quality Objectives," that specifies that the Central Valley Water Board *"will, on a*

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*case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.*” With respect to narrative objectives, the Regional Water Board must establish limitations using one or more of three specified sources, including: (1) USEPA’s published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the Regional Water Board’s “Policy for Application of Water Quality Objectives”), or (3) an indicator parameter. For purposes of this Order, all three sources will be used as part of the process described below.

Implementation of numeric and narrative water quality objectives under the Order involves an iterative process. The Order’s MRP establishes management plan trigger limits that are equivalent to the applicable Basin Plan numeric water quality objectives. For constituents that are not assigned Basin Plan numeric water quality objectives, Central Valley Water Board staff will develop trigger limits in consultation with the Department of Pesticide Regulation (for pesticides) and other agencies as appropriate. Central Valley Water Board staff will provide interested parties, including the Dischargers, with an opportunity to review and comment on the trigger limits. The Executive Officer will then provide the trigger limits to the Dischargers. Those trigger limits will be considered the numeric interpretation of the applicable narrative objectives. In locations where trigger limits are exceeded, water quality management plans must be developed that will form the basis for reporting which steps have been taken to achieve compliance with numeric and narrative water quality objectives.

### **X. Non-Point Source (NPS) Program**

This Order regulates waste discharges from irrigated agricultural lands to state waters as an NPS program. Accordingly, the waste discharge requirements must implement the provisions of the State Water Board’s *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy). Under the NPS Policy, the Regional Water Board must find that the program will promote attainment of water quality objectives. The nonpoint-source program also must meet the requirements of five key structural elements. These elements include (1) the purpose of the program must be stated and the program must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements; (2) describe the practices to be implemented and processes to be used to select and verify proper implementation of practices; (3) where it is necessary to allow time to achieve water quality requirements, include a specific time schedule, and corresponding quantifiable milestones designed to measure progress toward reaching specified requirements; (4) feedback mechanisms to determine whether the program is achieving its purpose; and (5) the consequences of failure to achieve the stated purpose.

This Order addresses each of the five key elements, as described below.

- (1) The purpose of this Order is to address the water quality impacts of surface water discharges from the area served by the GBP. The principal goal of the GBP is summarized as providing for the achievement of the water objectives set by the board and the Basin Plan related to subsurface drainage discharges from the Grassland Drainage Area while maintaining viable agricultural production in the area. The requirements of this Order include requirements to meet discharge and receiving water limitations, applicable water quality objectives as stated in the Basin Plan and the requirements of State Water Board Resolution 68-16 (antidegradation requirements). Further discussion of this Order’s implementation of antidegradation requirements is given below under the section titled “State Water Board Resolution 68-16.”
- (2) The board is prevented by Water Code section 13360 from prescribing specific management practices or measures to be implemented. However, it may set forth performance standards and require dischargers to report on what measures they have or will implement to meet those standards. This Order requires that the Dischargers report in the Drainage Management Plan updates on the actions that have or will be implemented to achieve compliance with discharge and receiving water limitations. The update will include the description of various control or management practices utilized to control the discharge of selenium and other constituents of

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concern and the milestones achieved set in the Basin Plan or previous annual reports under the Drainage Management Plan. The Drainage Management Plan may be submitted as part of the Annual Monitoring Report.

- (3) This Order requires the development and implementation of a management plan to meet water quality objectives stated in the Basin Plan. A time schedule for compliance with the Basin Plan objectives is part of this Order. In addition, this Order requires the development of SQMPs when water quality objectives are not met. For constituents that do not have a specific time schedule in the Basin Plan, SQMPs must include time schedules for implementing the plans and meeting the receiving water limitations (section II of the Order) as soon as practicable, but within a maximum of 10 years. The time schedules for the SQMPs must be consistent with the requirements for time schedules set forth in this Order. The time schedules must include quantifiable milestones that will be reviewed by the Executive Officer and the public prior to approval. The time schedule requirements in this Order are consistent with Key Element 3.
- (4) To provide feedback on whether program goals are being achieved, this Order requires surface water quality monitoring. This feedback will allow iterative implementation of practices to ensure that program goals are achieved. This feedback mechanisms required by this Order are consistent with Key Element 4.
- (5) This Order establishes the following consequences where requirements are not met:
  - (a) The Dischargers will be required, in an iterative process, to conduct additional monitoring and/or implement actions/measures when discharge or receiving water limitations or water quality objectives are not being met;
  - (b) Appropriate Central Valley Water Board enforcement action where the iterative process is unsuccessful, program requirements are not met, or time schedules are not met;

This Order describes consequences for failure to meet requirements and is consistent with Key Element 5.

## **XI. California Environmental Quality Act (CEQA)**

This Order is covered by the Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project (EIS/EIR).<sup>32</sup> The lead agency for the EIS was the U.S. Bureau of Reclamation. The lead agency pursuant to CEQA (Public Resources Code section 21100 et seq.) was the San Luis & Delta-Mendota Water Authority. A Notice of Determination (NOD) was filed on 12 October 2009.<sup>33</sup> A Record of Decision (ROD-07-141) was issued in December 2009. No legal challenges were made to either decisions.

This Order relies on the environmental impact analysis contained in the EIS/EIR to satisfy the requirements of CEQA. The EIS/EIR identifies the following mitigation measures that apply to surface water discharges regulated by this Order:

- Update and implement a water quality monitoring program. Results of the monitoring program for the GBP will be reviewed semi-annually, or more frequently as required, by the Oversight Committee. If unacceptable problems or impacts re identified, appropriate mitigative actions will be identified by the Oversight Committee to address the problems.

Appropriate mitigative actions may include, but not necessarily be limited to, interruption of specific identified contaminant pathways through hazing or habitat manipulation; increased

<sup>32</sup> Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report*. Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA

<sup>33</sup> NOD filed for the Grassland Bypass Project, 2010-2019, State Clearinghouse Number 2007121110.

management, enhancement, and recovery activities directed at impacted species in channels cleaned up as a result of the GBP, and/or establishment and attainment of more stringent contaminant load reductions. The costs of mitigation, as well as any required cleanup, will be borne by the draining parties. Monitoring to ensure the mitigative actions are effective will be required or continued to evaluate effectiveness.

- Implement the Storm Event Plan developed in 2007 when trigger event occurs. When major storm events occur, the Grassland Bypass Channel may not be able to handle the combined commingled discharge of surface runoff, storm water flows and agricultural drainage. Flow may be diverted to Grassland Water District channels. Increased water velocities in the Drain have the potential to scour and damage the structural integrity of the Drain, as well as releasing the accumulated sediment in the channel. The Storm Event Plan details a process for notifying regulatory and system users, the trigger velocity when gates to the Grassland Water District supply channel may be opened and then closed, and a requirement for daily monitoring to determine quantity and quality of the bypassed flows.

The board Order requires implementation of these mitigation measures.

## **XII. Statement of Policy With Respect to Maintaining High Quality Waters in California (State Water Board Resolution 68-16)**

This section of the Information Sheet first provides background on State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16). Following the background discussion, the Information Sheet describes how the various provisions in the WDR and MRP collectively implement Resolution 68-16. In summary, the requirements of Resolution 68-16 are met through a combination of upfront project-level planning and implementation; monitoring and assessments to determine trends; and regional planning and revisions to project implementation when trends in degradation are identified. This project has been in operation since 1996 and it has been regulated by WDRs since 1998. Monitoring has demonstrated that there have been significant reductions in the discharge of selenium and salt.

Regional trend monitoring of surface water together with periodic assessments of available surface water information is required to determine compliance with water quality objectives and determine whether any trends in water quality improvement or degradation are occurring. If trends in such degradation are identified that could result in impacts to beneficial uses, a surface quality management plan must be prepared by the Dischargers. The plan must include the identification of steps that will be implemented to address the trend in degradation and an evaluation of the effectiveness of those practices in addressing the degradation. Failure to implement improved practices will result in further direct regulation by the board, including, but not limited to, taking enforcement action.

A separate Board order will be developed for regulation of discharges to groundwater from the area served by the GBP. As discussed further below, the combination of these requirements fulfill the requirements of Resolution 68-16 for any degradation of high quality waters authorized by this Order.

### **A. Background**

Basin Plan water quality objectives are developed to ensure that beneficial uses are protected. The quality of some state surface waters is higher than established Basin Plan water quality objectives. For example, nutrient levels in good, or “high quality” waters may be very low, or not detectable, while existing water quality standards for nutrients may be much higher. In such waters, some degradation of water quality may occur without compromising protection of beneficial uses. State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16) was adopted in October of 1968 to address high quality waters in the state. Title 40 of the Code of Federal Regulations, Section 131.12 -- Antidegradation Policy (40 CFR 131.12) was developed in 1975 to ensure water quality necessary to protect existing uses in waters of the United

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States. Resolution 68-16 applies to discharges to all high quality waters of the state (Water Code section 13050[e]); 40 CFR 131.12 applies only to surface waters.

The requirement to implement the Antidegradation Policy is contained in Resolution 68-16 (provision 2 presented below) and in the Basin Plan. The Basin Plan states that the Central Valley Water Board actions must conform to State Water Board plans and policies and among these policies is Resolution 68-16, which requires that:

1. "Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies."
2. "Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

For discharges to surface waters only, the Federal Antidegradation Policy (Section 131.12, Title 40, CFR) requires:

1. "Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
2. Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.
3. When high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.
4. In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act."

The State Water Board has interpreted Resolution 68-16 to incorporate the Federal Antidegradation Policy in situations where the policy is applicable. (SWRCB Order WQ 86-17). The application of the Federal Antidegradation Policy to nonpoint source discharges (including discharges from irrigated agriculture) is limited.<sup>34</sup>

<sup>34</sup> 40 CFR 131.12(a)(2) requires that the "State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and *all cost-effective and reasonable best management practices for nonpoint source control*." The EPA Handbook, Chapter 4, clarifies this as follows: "Section 131.12(a)(2) does not mandate that States establish controls on nonpoint sources. The Act leaves it to the States to determine what, if any, controls on nonpoint sources are needed to provide attainment of State water quality standards (See CWA Section 319). States may adopt enforceable requirements, or voluntary programs to address nonpoint source pollution. Section 40 CFR 131.12(a)(2)

Administrative Procedures Update (APU) 90-004, Antidegradation Policy Implementation for NPDES Permitting, provides guidance for the Regional Water Boards in implementing Resolution 68-16 and 40 CFR 131.12, as these provisions apply to NPDES permitting. APU 90-004 is not applicable in the context of this Order because nonpoint discharges from agriculture are exempt from NPDES permitting.

A number of key terms are relevant to application of Resolution 68-16 and 40 CFR 131.12 to this Order. These terms are described below.

**High Quality Waters:** Resolution 68-16 applies whenever “existing quality of water is better than quality established in policies as of the date such policies become effective,”<sup>35</sup> and 40 CFR 131.12 refers to “quality of waters [that] exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation.” Such waters are “high quality waters” under the state and federal antidegradation policies. In other words, high quality waters are waters with a background quality of better quality than that necessary to protect beneficial uses.<sup>36</sup> The Water Code directs the State Water Board and the Regional Water Boards to establish water quality objectives for the reasonable protection of beneficial uses. Therefore, where water bodies contain levels of water quality constituents or characteristics that are better than the established water quality objectives, such waters are considered high quality waters.

Both state and federal guidance indicates that the definition of high quality waters is established by constituent or parameter [State Water Board Order WQ 91-10; USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 CFR 131.12) (“EPA Handbook”)]. Waters can be of high quality for some constituents or beneficial uses but not for others.

In order to determine whether a water body is a high quality water with regard to a given constituent, the background quality of the water body unaffected by the discharge must be compared to the water quality objectives. If the quality of a water body has declined since the adoption of the relevant policies and that subsequent lowering was not a result of regulatory action consistent with the state antidegradation policy, a baseline representing the historically higher water quality may be an appropriate representation of background.<sup>37</sup> However, if the decline in water quality was permitted consistent with state and federal antidegradation policies, the most recent water quality resulting from permitted action constitutes the relevant baseline for determination of whether the water body is high quality (see, e.g., SWRCB Order WQ 2009-0007 page 12). Additionally, if water quality conditions have improved historically, the current higher water quality would again be the point of comparison for determining the status of the water body as a high quality water.

**Best Practicable Treatment or Control:** Resolution 68-16 requires that, where degradation of high quality waters is permitted, best practicable treatment or control (BPTC) limits the amount of degradation that may occur. Neither the Water Code nor Resolution 68-16 defines the term “best practicable treatment or control.”

Despite the lack of a BPTC definition, certain State Water Board water quality orders and other documents provide direction on the interpretation of BPTC. The State Water Board has stated: “one factor to be considered in determining BPTC would be the water quality achieved by other similarly

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does not require that States adopt or implement best management practices for nonpoint sources prior to allowing point source degradation of a high quality water. However, States that have adopted nonpoint source controls must assure that such controls are properly implemented before authorization is granted to allow point source degradation of water quality.” Accordingly, in the context of nonpoint discharges, the BPTC standard established by state law controls.

<sup>35</sup> Such policies would include policies such as State Water Board Resolution 88-63, Sources of Drinking Water Policy, establishing beneficial uses, and water quality control plans.

<sup>36</sup> USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 CFR 131.12) , defines “high quality waters” as “those whose quality exceeds that necessary to protect the section 101(a)(2) goals of the Act [Clean Water Act], regardless of use designation.”

<sup>37</sup> The state antidegradation policy was adopted in 1968, therefore water quality as far back as 1968 may be relevant to an antidegradation analysis. For purposes of application of the federal antidegradation policy only, the relevant year would be 1975.

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situated dischargers, and the methods used to achieve that water quality” (see Order WQ 2000-07, pages 10-11). In a “Questions and Answers” document for Resolution 68-16 (the Questions and Answers Document), BPTC is interpreted to additionally include a comparison of the proposed method to existing proven technology; evaluation of performance data (through treatability studies); comparison of alternative methods of treatment or control, and consideration of methods currently used by the dischargers or similarly situated dischargers.<sup>38</sup> The costs of the treatment or control should also be considered. Many of the above considerations are made under the “best efforts” approach described later in this section. In fact, the State Water Board has not distinguished between the level of treatment and control required under BPTC and what can be achieved through “best efforts.”

The Regional Water Board may not “specify the design, location, type of construction, or particular manner in which compliance may be had with [a] requirement, order, or decree” (Water Code 13360). However, the Regional Water Board still must require the dischargers to demonstrate that the proposed manner of compliance constitutes BPTC (SWRCB Order WQ 2000-7). The requirement of BPTC is discussed in greater detail below.

**Maximum Benefit to People of the State:** Resolution 68-16 requires that where degradation of water quality is permitted, such degradation must be consistent with the “maximum benefit to people of the state.” Only after “intergovernmental coordination and public participation” and a determination that “allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located” does 40 CFR 131.12 allow for degradation.

As described in the Question and Answers Document, factors considered in determining whether degradation of water quality is consistent with maximum benefit to people of the State include economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. With reference to economic costs, both costs to the dischargers and the affected public are considered. Closely related to the BPTC requirement, consideration must be given to alternative treatment and control methods and whether lower water quality can be abated or avoided through reasonable means, and the implementation of feasible alternative treatment or control methods should be considered.

USEPA guidance clarifies that the federal antidegradation provision “is not a ‘no growth’ rule and was never designed or intended to be such. It is a policy that allows public decisions to be made on important environmental actions. Where the state intends to provide for development, it may decide under this section, after satisfying the requirements for intergovernmental coordination and public participation, that some lowering of water quality in “high quality waters” is necessary to accommodate important economic or social development” (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Chapter 4). Similarly, under Resolution 68-16, degradation is permitted where maximum benefit to the people of the state is demonstrated.

**Water Quality Objectives and Beneficial Uses:** As a floor, any degradation permitted under the antidegradation policies must not cause an exceedance of water quality objectives or a pollution or nuisance. Furthermore, the NPS Policy establishes a floor for all water bodies in that implementation programs must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses. This Order allows a set time period in which the Dischargers exceed water quality objectives while establishing the controls and treatment required to meet those objectives.

### **Waters that are Not High Quality: The “Best Efforts” Approach**

Where a water body is at or exceeding water quality objectives already, it is not a high quality water and is not subject to the requirements of the antidegradation policy. Data collected by the Central Valley

<sup>38</sup> See Questions and Answers, State Water Resources Control Board, Resolution 68-16 (February 16, 1995).

Water Board, dischargers, federal and State agencies, and others demonstrate that water bodies receiving discharge from the GBP are already impaired for some constituents associated with irrigated agricultural activities.

The “best efforts” approach involves the Regional Water Board establishing limitations expected to be achieved using reasonable control measures. Factors which should be analyzed under the “best efforts” approach include the effluent quality achieved by other similarly situated dischargers, the good faith efforts of the discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance (SWRCB Order WQ 81-5, page 7). The State Water Board has applied the “best efforts” factors in interpreting BPTC (see SWRCB Order Nos. WQ 79-14, and WQ 2000-07).

### **B. Application of Resolution 68-16 Requirements to this Order**

The determination of a high quality water within the meaning of the antidegradation policies is water body and constituent-specific.

As stated above, some water bodies receiving discharge from the GBP are already impaired for some constituents. Those same receiving water bodies meet objectives for particular constituents and would be considered “high quality waters” with respect to those constituents.

The temporary degradation of Mud Slough (north) and the San Joaquin River between Mud Slough (north) and the Merced River is allowed through policies established in the Basin Plan. This temporary degradation is allowed because: 1) the continuation of the GBP discharges diverts drainage away from Salt Slough and the wetland water supply channels listed in Appendix 40, as afforded by the regional drainage management project, and has long-term environmental benefits to the wildlife utilizing this portion of the Pacific Flyway and the Grasslands Ecological Area; 2) the farm-based economy of the area would be adversely affected by the discontinuation of the GBP; and 3) it provides time for the development of regional drainage management capability to meet water quality objectives.

Any application of the antidegradation requirements must account for the fact that at least some of the waters into which the subsurface agricultural wastes discharge are high quality waters for some constituents. Further, the Order provisions should also account for the fact that even where a water body is not high quality (such that discharge into that water body is not subject to the antidegradation policy), the board should, under State Water Board precedent, impose limitations more stringent than the objectives set forth in the Basin Plan, if those limits can be met by “best efforts.”

The WDR and MRP for the Grassland Bypass Project are intended to allow a means for Grassland Area Farmers to implement measures to meet the discharge and receiving limitations, and eventually the water quality objectives for the San Joaquin River. Continuation of the Project will allow water quality to improve by the implementation of “best effort” measures by the Grassland Area Farmers.

### **C. Consistency with BPTC and the “Best Efforts” Approach**

Due to the numerous commodities being grown, the different water management systems in place and the regional nature of the problem, identification of a specific technology or treatment device as BPTC or “best efforts” has not been accomplished. The Central Valley Water Board recognizes that there is often site-specific, crop-specific, and regional variability that affects the selection of appropriate management practices, as well as design constraints and pollution-control effectiveness of various practices. In addition, the board recognizes that the gains made in previous years in the area served by the GBP are a result of a combination of individual grower improvements, improvements made at the district level, and regional efforts.

The GBP needs the flexibility to explore, implement and evaluate control and treatment measure that best achieve performance expectations. These control and treatment measures will operate on a regional basis to lower the discharge loads of selenium, salts and boron. More than one means of control

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or treatment has been and will likely continue to be required for these constituents in order to meet the water quality objectives for the San Joaquin River.

There is no specific set of technologies or treatment devices that can be said to achieve BPTC/best efforts universally in the watershed considering the crop variety and factors (e.g., water allocation) affecting individual farms in the Grassland Drainage Area. The Basin Plan in Chapter IV, page IV-31.00 states:

1. "In developing control actions for selenium, the Regional Board will utilize a priority system which focuses on a combination of sensitivity of the beneficial use to selenium and the environmental benefit expected from the action.
2. Control actions which result in selenium load reductions are most effective in meeting water quality objectives.
3. With the uncertainty in the effectiveness of each control action, the regulatory program will be conducted as a series of short-term actions that are designed to meet long-term water quality objectives.
4. Best management practices such as water conservation measures, are applicable to the control of agricultural subsurface drainage."

The efforts of the Grassland Area Farmers to 1) limit the discharge from the Grassland Drainage Area; 2) the projects initiated under the San Joaquin River Improvement Project; and 3) the reuse of subsurface drainage is considered "best efforts" by the Central Valley Water Board. These efforts have lowered the selenium loading from the GBP to the San Joaquin River so that a section of the San Joaquin River has been delisted for selenium under 303(d).

BPTC is not defined in Resolution 68-16. However, the State Water Board describes in their 1995 Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g., through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers." Measures have been implemented by the Grassland Area Farmers to eliminate tailwater from the Grassland Bypass Channel and to test different technologies for selenium removal at the SJRIPP treatment facility. These measures and other implemented actions to achieve discharge and effluent limitations constitute BPTC/best efforts.

- As part of California's Nonpoint Source Pollution Control Program, the State Water Board, California Coastal Commission, and other state agencies have identified seven management measures to address agricultural nonpoint sources of pollution that affect state waters (*California's Management Measures for Polluted Runoff*, referred to below as "Agriculture Management Measures").<sup>39</sup> The agricultural management measures include practices and plans installed under various NPS programs in California, including systems of practices commonly used and recommended by the USDA as components of resource management systems, water quality management plans, and agricultural waste management systems.
- USEPA's National Management Measures to Control Nonpoint Source Pollution from Agriculture (EPA 841-B-03-004, July 2003;),<sup>40</sup> "is a technical guidance and reference document for use by State, local, and tribal managers in the implementation of nonpoint source pollution management programs. It contains information on the best available, economically achievable means of reducing pollution of surface and ground water from agriculture."

<sup>39</sup> *California's Management Measures for Polluted Runoff*  
([http://www.waterboards.ca.gov/water\\_issues/programs/nps/docs/cammpr/info.pdf](http://www.waterboards.ca.gov/water_issues/programs/nps/docs/cammpr/info.pdf))

<sup>40</sup> *National Management Measures to Control Nonpoint Source Pollution from Agriculture*  
([http://water.epa.gov/polwaste/nps/agriculture/agmm\\_index.cfm](http://water.epa.gov/polwaste/nps/agriculture/agmm_index.cfm))

Discharges from the GBP to surface waters consist primarily of subsurface agricultural drainage and stormwater runoff from agricultural lands. Both of the above guidance documents describe a series of management measures. The agricultural management measures described in the state and USEPA reference documents generally include: 1) erosion and sediment control, 2) facility wastewater and runoff from confined animal facilities, 3) nutrient management, 4) pesticide management, 5) grazing management, 6) irrigation water management, and 7) education and outreach. A comparison of the recommendations with the management practices implemented by the Dischargers and GAF is provided below.

- *Management measure 1, erosion and sediment control.* The Order places limits on the maximum flow rate in the San Luis Drain to prevent scouring and the mobilization of drain sediments. The Use Agreement states that “[t]o avoid re-suspending sediment in the Drain, the maximum rate of flow in the Drain shall be 150 cfs” and that “[u]nder normal operations, flows will be slow enough to not cause sediment movement.” In addition, Grassland Area Farmers are not allowed to discharge tailwaters into water district canals.
- *Management measure 2 is not applicable,* as this Order does not address waste discharges from confined animal facilities.
- *Management measure 3, nutrient management.* As described in the State’s Agricultural Management Measures document, “this measure addresses the development and implementation of comprehensive nutrient management plans for areas where nutrient runoff is a problem affecting coastal waters and/or water bodies listed as impaired by nutrients.” Where nutrients are causing exceedances of water quality objectives in surface waters, this Order would require development of a detailed SQMP which would address sources of nutrients and require implementation of practices to manage nutrients. Collectively, these requirements work together in a manner consistent with management measure 3.
- *Management measure 4, pesticide management.* As described in the State’s Agricultural Management Measures document, this measure “is intended to reduce contamination of surface water from pesticides.” The Grassland Area Farmers are to implement practices that minimize waste discharge to surface water (such as pesticides), prevent pollution and nuisance, and achieve and maintain water quality objectives.
- *Management measure 5, grazing management.* is not applicable, as the Grassland Drainage Area contains minimal acreage used for grazing.
- *Management measure 6, irrigation water management.* As described in the state Agricultural Management Measures document, this measure “promotes effective irrigation while reducing pollutant delivery to surface and ground waters.” The Grassland Area Farmers are not allowed to discharge tailwater into the Grassland Bypass Channel. Control and treatment technologies are being explored to minimize the release of selenium and salts to the discharge point. Reuse of the subsurface drainage is also being utilized to meet effluent and discharge limitations and eventually the water quality objective.
- *Management measure 7, education and outreach.* The Order requires that the Dischargers meet specific performance standards and deadlines. The Dischargers have used education and outreach to the Grassland Area Farmers in the past to inform growers of projects in the SJRIP and monitoring results for salinity and selenium. It is anticipated that this approach will be used, as necessary, in the future.

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Implementation of actions to achieve the Order’s effluent and receiving water limitations described above are consistent with the state and federal guidance for management measures. Implementation of these measures for compliance with the requirements of the Order will lead to implementation of BPTC/best efforts by the Project

1. Additional Planning and Implementation Measures (SQMPs)

This Order requires development of surface water quality management plans where degradation trends are observed that threaten to impair a beneficial use or where beneficial uses are impaired (i.e., water quality objectives are not being met). SQMPs include requirements to investigate sources, develop strategies to implement actions to ensure waste discharges are meeting the Orders effluent and receiving water limitations, and implement a monitoring strategy to provide feedback on the effectiveness of the management plan. In addition, the SQMPs must include actions to “Identify, validate, and implement management practices to reduce loading of COC’s [constituents of concern] to the subsurface agricultural discharge, thereby improving water quality” (see Appendix MRP-1). Under these plans, additional actions or technology will be implemented in an iterative manner, to ensure that the measures represent BPTC/best efforts and that degradation does not threaten beneficial uses. The SQMPs need to meet the performance standards set forth in this Order. The SQMPs are also reviewed periodically to determine whether adequate progress is being made to address the degradation trend or impairment. If adequate progress is not being made, then the Executive Officer can require field monitoring studies. or the board may revoke the coverage under this Order.

It is also important to note that in some cases, other agencies may establish performance standards that are equivalent to BPTC and may be relied upon as part of a SQMP. For example, the Bureau may remove, at its discretion, sediment and organic materials deposited in the Drain at any time during the term of its present Use Agreement.

The State Water Board indicates in its Questions and Answers, Resolution 68-16: “To evaluate the best practicable treatment or control method, the discharger should evaluate performance data, e.g., through treatability studies...” Water quality management plans, referred to as SQMPs above, institute an iterative process whereby the effectiveness of any measures taken to minimize will be periodically reevaluated as necessary and/or as more recent and detailed water quality data become available. The Dischargers are also required in the WDR to submit annually a Drainage Management Plan that details the specific control or treatment methods implemented for subsurface drainage to comply with water quality objectives contained in the Basin Plan for discharges from the GBP. This process of reviewing data and instituting additional measures where necessary will continue to assure that BPTC/best efforts are implemented and will facilitate the collection of information necessary to demonstrate the performance of the measures. This iterative process will also ensure that the highest water quality consistent with maximum benefit to the people of the state will be maintained.

Resolution 68-16 does not require Dischargers to use technology that is better than necessary to prevent degradation (as evaluated on a constituent by constituent basis). As such, the board presumes that the requirements of this Order are sufficiently achieving BPTC for constituents and locations where degradation is not occurring.

**D. Summary**

The Dischargers are required to implement measures to meet the above goals and periodically review the effectiveness of implemented measures and make improvements where necessary. Also, the Order requires water quality monitoring and assessments aimed to identify trends, evaluate effectiveness of management practices, and detect exceedances of water quality objectives. The process of periodic review of SQMPs, review of monitoring data, and updates to the Drainage Management Plan provides mechanisms for the board to better ensure that the Dischargers are meeting the requirements of the Order.

The Order is designed to achieve site-specific antidegradation and antidegradation-related requirements through implementation of BPTC/best efforts as appropriate and monitoring, evaluation, and reporting to confirm the effectiveness of the BPTC/best efforts measures in achieving their goals. The Order relies on implementation of control and treatment technologies that constitute BPTC/best efforts, based to the

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extent possible on existing data, and requires the water quality monitoring to ensure that the selected measures in fact constitute BPTC where degradation of high quality waters is or may be occurring, and best efforts where waters are already degraded.

This Order allows limited degradation of existing high quality waters while best efforts measures are being implemented. The Basin Plan sets performance goals to meet water quality objectives while these measures are being implemented. This limited degradation is consistent with maximum benefit to the people of the state for the following reasons:

- At a minimum, this Order requires that the effluent and receiving waters achieve and maintain compliance with the discharge limitations in the Basin Plan and protect existing beneficial uses;
- The requirements implementing the Order will result in use of BPTC where waste discharges may cause degradation of high quality waters. Where waters are already degraded, the requirements will result in pollution controls that reflect the “best efforts” approach. Confirmation of BPTC/best efforts will be shown by monitoring data.
- Consistent with the Order’s stated goal of ensuring subsurface agricultural discharges do not impair access to safe and reliable drinking water, the Order protects high quality waters relied on by local communities from degradation of their water supplies by current practices in the Grassland Drainage Area. The Order is designed to prevent subsurface discharges from the Grassland Drainage Area from causing or contributing to exceedances of water quality objectives, which include maximum contaminant levels for drinking water. The Order also is designed to detect and address exceedances of water quality objectives, if they occur, in accordance with the compliance time schedules provided therein. Therefore, local communities should not incur any additional treatment costs associated with the limited degradation authorized by this Order; and
- The Order includes performance standards that will work to prevent further degradation of surface water quality.

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The requirements of the Order and the limited degradation that would be allowed are consistent with State Water Board Resolution 68-16. The requirements of the Order will result in the implementation of best efforts necessary to assure no further degradation of water quality with the maximum benefit to the people of the state. The water limitations in section II of the Order, the compliance schedules in section II and the Basin Plan, and the Monitoring and Reporting Program’s requirements to track compliance with the Order, are designed to ensure that further degradation of water quality will not occur and that the limited degradation will not unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. Finally, the iterative process of reviewing data and instituting additional measures when necessary will ensure that the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

### **XIII. California Water Code Section 13141**

The Phase III EIR/EIS examined the socioeconomic impacts to the region under three scenarios: 1) No Action Alternative; 2) Proposed Action; and 3) Alternate Action. The No Action Alternative assumed termination of the GBP. The Proposed Action would implement the 2009 Use Agreement conditions for the GBP. The Alternative Action examined a continuation of the GBP, but at the level set in the 2001 Use Agreement.

The key farm-level variable used for measurement of impact significance was farm profit. Farm profit summarizes the effects of an alternative on the long-run viability of farming in the area and was measured relative to estimated 2007 existing conditions. All three alternatives examined the projected effects from 2010 to 2019. Each alternative had negative annual impacts when compared to the 2007 existing conditions. The most extreme impact was the No Action Alternative which soil and water salinity would increase, crop yields and revenues would decline, acreages would shift among crops, but total

cropped acreage would remain very similar between 2010 and 2019. The economic impact between the Proposed Alternative and the Alternative Action were insignificant.

The Alternative Action would not lower selenium levels below those set in the 2001 Use Agreement. The Proposed Action would lower these levels in accordance with the 2009 Use Agreement, which would lower selenium loading significantly below the TMML and improve the water quality of the lower San Joaquin River.

#### **XIV. California Water Code Section 13263**

California Water Code section 13263 requires that the Central Valley Water Board consider the following factors, found in section 13241, when considering adoption of waste discharge requirements.

- (a) Past, present, and probable future beneficial uses of water  
The Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan) identifies applicable beneficial uses of surface within the Sacramento River Basin, including the Grassland Watershed. Identified beneficial uses for Salt Slough, Mud Slough (north) and wetland water supply channels include irrigation,<sup>41</sup> stock watering, contact recreation, other noncontact recreation, warm freshwater habitat, warm spawning, wildlife habitat, commercial use, and shellfish. The Order protects the beneficial uses identified in the Basin Plan. Applicable past, present, and probable future beneficial uses of the Grassland Watershed waters were considered by the Central Valley Water Board as part of the Basin Planning process and are reflected in the Basin Plans themselves. Mud Slough, the San Joaquin River and the wetland supply channels, the water bodies subject to discharges from the area served by the GBP, are all listed in the Basin Plan along with their designated beneficial uses.
- (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto  
Environmental characteristics of the Grassland watershed have been considered in the development of this Order. This information is contained in the *August 2009 Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019*.
- (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area  
This Order provides a process to review these factors during implementation of water quality management plans (SQMPs). The Order requires that agricultural subsurface discharges to surface water do not cause or contribute to an exceedance of applicable discharge limitations set in the Basin Plan or to water quality objectives. SQMPs are required in areas where discharge limitations or water quality objectives are not being met and are not being addressed by existing SQMPs. Under these plans, sources of waste must be estimated along with background water quality to determine what options exist for reducing waste discharge to ensure that the Project is in compliance with water limitations and objectives. The SQMPs must be designed to ensure that agricultural subsurface discharges do not cause or contribute to an exceedance of water limitations or a water quality objective set in the Basin Plan, and meet other applicable requirements of the Order, including, but limited to, section II.
- (d) Economic considerations  
The EIR/EIS for the Project from 2010 to 2019 anticipated economic effects to be farm income linked to farm investment and consumption. Regional economic activity would be affected due to the linkages between production agriculture and a myriad of other sectors of the economy. This Order allows for the continuation of farm activities and the use of the Drain. Costs for this Order into Phase III of the Project are borne by the farmers in the Grassland Drainage Area. Implementation of this

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<sup>41</sup> Basin Plan footnote for Mud Slough (north) and wetland water supply channels states “[e]levated natural salt and boron concentrations may limit this use to irrigation of salt and boron tolerant crops. Intermittent low flow conditions may also limit this use.”

Order is expected to increase farm profits from crop production compared to the No Action alternative (no use agreement for the Drain) until 2015 when an anticipated treatment facility is operational and annual costs will decrease farm profits. The decrease in profits is estimated to fall slight below profits from the No Action alternative for the period from 2015 to 2019. This Order will not unreasonably affect the Grassland Area Farmers or region adversely.

(e) The need for developing housing within the region

This Order establishes waste discharge requirements for subsurface agricultural discharges and stormwater runoff from the area served by the Grassland Bypass Project, where the land use is primarily irrigated agriculture. The Order is not intended to establish requirements for any facilities that accept wastewater from residences or stormwater runoff from residential areas. This Order will not affect the development of housing within the region.

(f) The need to develop and use recycled water

This Order does not establish any requirements for the use or purveyance of recycled wastewater. The SJRIP treatment facility will treat subsurface drainage and plans to recycle the treated lower selenium/salt effluent back into the fields where the drainage originated. No waste discharge requirements will be required for this pilot facility since the discharge will be recycled into essentially a closed loop system (see Figure 12).

The GAF and water districts have been recycling water by using tailwater recovery systems and by blending subsurface drainage with irrigation water. The subsurface drainage is also recycled to wet roads for dust controls.

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